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EDITORIAL NOTES—GAS, &c.

Some Reflections on the Legislative Work of the Gas Industry.

WITH the country in a condition of turmoil politically, industrially, and commercially, Parliament temporarily suspended its business last Friday, and will assemble again to-day with the hope strongly pervading the chamber that the conditions of the country will then be such that the long-looked-for vacation may commence. But feelings among the members are not the most pleasant that the conditions of public business are such this session that it will be necessary to have recourse to an autumn sitting, which will demand their return to the benches during October. It has been a remarkable session, and it will add a sensational chapter to our legislative history. What the recent events are all leading to, it is not our business to inquire into here; but it would be idle on the part of anyone who examines these events with more than superficial interest to assert that they will germinate and ultimately flourish to the benefit of the industries of the country. While in the large matters of political importance and significance the session has been a remarkable one, the same adjective will apply to the diametrically opposite conditions that have ruled in connection with Private Bill Legislation. In this we have had a succession of several lean years; but the worst of them all is the one the end of the work of which we have about reached. Regarding the session from the standpoint supplied by a long experience of the Committee rooms, it is about the most void in feature that there has been within memory; and, from the point of view of those whose talents are devoted to parliamentary work of this kind, there is no desire to see its repetition. It has been weak, practically empty, and colourless; and an inspection of the prospects does not engender any great hopefulness for a sensible amount of improvement in the more immediate future.

That is speaking generally; and if we look particularly to the gas industry, there is not much in view to encourage the expectation of a spurt in business, and of the contentious kind. This is merely a reflection of current circumstances. Though business is extending, though the opportunities for business are rapidly expanding, though on every side are seen possible openings for new and remunerative business, at the present time the conditions are such that no large supplement of productive plant is required, nor the addition of area to the works' ground. The economies of the incandescent burner, which are greater to-day than they have ever been through the inverted burner, have put gas in hand for other business. The growth of the business by the spreading of the demand over a greater number of the hours of the day—both in winter and summer—has yielded its several economies. The increased yield of gas per ton of coal has curtailed the necessity for works extensions to meet new business; and the fact that newer forms of carbonizing plant take up for a given productive capacity much less space than the old plant, will render unnecessary for a time in many places any imperative seeking for new statutory powers over land for manufacturing purposes. The replacing of inefficiency by efficiency out of revenue also enables the husbanding of capital. So that current conditions appear temporarily non-contributive in assisting to the promotion of greater activity in parliamentary applications in connection with those matters that are most provocative of local opposition, and therefore of contest in Parliament. There are, however, modern powers in association with the gas industry the possession of which lends a hand in well-doing for both consumers and concern that, being accepted and approved by Parliament, can be secured without much trouble and expense, as this session shows—for example, the procuring of the right to use the "Metropolitan" No. 2 burner, and the reduction of useless illuminating power standards of gas, and some not only useless, but, by their excess, absolutely invalidating the interests of the consumers in realizing the best possible from the gas appliances at command. Therefore, while there is this settling down by the gas industry on the foundations provided by the modern conditions of gas manufacture and supply, we may be confident of seeing its effect upon parliamentary business.

But there is necessity for warning. Provision in the matter of legislative power should have an eye not only to the present, but to the future. If there had been (we are conscious of the ease with which one can talk with experience in these matters spread before him, or, to use a colloquialism, "after the event") greater prevision in matters legislative in the past, there would have been less combatative work in the Committee Rooms in past sessions than there has been. The oversights of one period produce future loss to some and benefits to others; and the remedy is often harder to secure than would have been the right thing in the original instance. We see this more especially in respect of territorial matters connected with works and in association with areas of supply. While the ruling powers of gas undertakings are resting thankful that modern conditions have tended to increase the capacity of their works for larger business, that modern conditions have tended to consolidate and enlarge the business by the growing day applications of gas, and that they have opened up hitherto dormant means to fresh economies, it would be as well to look round and ascertain where this is all leading to. Business, except in the "Sleepy "Hollows" of the country, where local development is quiescent or very slow, must develop. With this condition obtaining, certain it is that there must be limits, with all the advantages of the present, to many works' sites being sufficient for the future; and year by year in many places, land in juxtaposition to gas-works will be more difficult and more expensive to secure. There is yet another land question—affecting the territory in which the business is carried on. Within many a supply area, there is plenty of work to be done in developing business on modern lines; but there again every existing supply area has its limits. The outlook to be taken in this regard must be a wide one. There comes in the question of the supply of the out-districts. Electrical suppliers—electric power companies, for instance—are looking out for these rural areas; but modern development has put into the hands of gas suppliers the means of embracing in their areas such districts upon the most economical terms. High-pressure transmission of the lower illuminating quality of gas now supplied can be carried out more profitably than when larger pipe-lines had to be laid and gasholders constructed with the view of affording protection and compensation between the periods of high and low demand. These outer districts want bringing in as quickly as possible. The prospect, as well as an immediate 10 per cent. return on the capital, has to be examined. The first arrival there, whether it be gas or electricity, will be the one to get the larger hold of the cream of the business. The great difficulty of one concern following another in establishing itself is known best to those who have tried it. It often means many dreary years of hard and non-dividend or non-interest paying work. The modern conditions of gas supply mean much for the time ahead; and preparation has to be made. Then legislate betimes for the morrow.

One other point crosses the mind. Two salient and important matters there are upon which it may be taken Parliament has at length made up its mind in connection with the gas industry, though it took a vast amount of power to drive the facts home. The first one is that the conditions of the industry in the matter of the uses to which gas is put are not what they were, and that consequently, the legislation applying to other days and circumstances will not apply with the same inflexibility that was then considered correct. Secondly, that the gas industry has now to go out for business and meet competition even after the manner of all commerce that is not subject to statutory control or territorial limitations. Parliamentary

authorities now recognize this; but we doubt whether they have assembled these competitive conditions and set them in orderly array for inspection, so as to be fully cognizant of their active existence and power. In lighting, the gas industry has as competitors electricity and a larger supply of oil than in former days. The incandescent burner having rendered almost *nil* in value the luminosity of gas-flames, has opened up large opportunities for development in cooking and heating generally—both domestic and industrial; but there again solid fuels and electricity are active competitors, and try to bar the way. The development of the gas industry, technically and commercially, is bringing down the price of gas all round; and the cheaper gas can be sold the stronger its stand among other agents for motive power purposes. Here steam, electricity, suction or pressure gas plants, producer gas plants, and oil engines are in competition with town gas. All the competitors, with the single exception of electricity, are without any statutory control; and in the case of electricity, the purveyors of the energy have no statutory restriction as to the price at which they offer it for this purpose, even though the price be lower than the average generating cost per unit, without considering capital and other charges. The parliamentary authorities will see from this that the gas industry requires as much reasonable freedom as possible, and not to be manacled in their work of meeting the competition and of rendering the utmost service, in the most economical way, to the community. In the case of gas companies, there are the safeguards furnished by the sliding-scale. We perceive the growth among the parliamentary authorities of a proper recognition of all this; and the quicker it is fully appreciated by them, the better for the body-politic and for the industry. And any man who steps in and advises the parliamentary authorities to the contrary, any man who attempts to curtail by any means the maximum liberty that Parliament will allow, is an enemy to the gas industry.

The Revolt of the Railway Workers.

Events march quickly in these days. The one topic for the country last week was the great revolution of railway labour against authority, contract, and honour, and the consequent plunging of the whole country into a state of chaos, general inconvenience, and incalculable loss. The beginning of this week finds the men, with the exception of a few thousand at Manchester, Newcastle, and Hull, back again at work, and the railway services for the most part proceeding as though there had been no attempt to bring about their general stoppage last week. The settlement that effected this sudden metamorphosis is due to the unflagging determination of the Government to bring into existence understanding and machinery whereby the differences between the parties to the dispute could be hereafter composed; and the news of the success of the negotiations came, at the end of the week, as a refreshing draught to the country at large.

There is no necessity to go into the details of the whole story here. They have been told in their every phase with a fulness in the ordinary channels of intelligence that have made the entire matter common knowledge throughout the land. The Railway Companies, it is generally acknowledged, did right in standing firm; while the railway men, it is commonly agreed, violated all the canons of propriety and fair dealing as between master and man, in view of the agreement and settlement of 1907. There is not a shred of justification for the action of the men; and the settlement actually arrived at emphasizes this, inasmuch as, at its very foundation, is the offer made by the Government, and accepted by the Companies before the men left work, to have a special inquiry into the grounds of the grievances of the latter. At the bottom of all the trouble are the revolt of the Unions against the principles of conciliation and arbitration, and the refusal of the Railway Companies to recognize the officials of the men's Unions. While we all hope for the best, these facts raise gloomy doubts as to perpetual peace being established, as the result of the inquiry, and the endeavour to produce satisfaction among all ranks of the men. What has happened proves again that conciliation schemes such as the one that has been in existence since 1907 in connection with the greater number of the railway systems of the country, are ineffectual modes of maintaining industrial peace. It was asserted by Sir George Livesey several years since that all such machinery for settling labour troubles was defective and inadequate, and could have no lasting effect. Events have since proved the truth of the assertion and prediction. But vivid as was Sir George's imagination, keen as was his penetrative powers, he could hardly have expected that his words would have been sealed and endorsed in such a calamitous, and, we will add, discreditable and despotic, manner as was the case last week. The late leader of the gas industry was convinced that "the only "way" to effect a lasting peace in the labour world was to radically change the conditions of the worker; and this he did in a manner that makes it impossible for London to suffer the terrors and the inconveniences of any deprivation of its gas supply. In short, co-partnership is a public benefactor of inestimable value.

The other sides of this revolution of the railway workers in which the gas industry is concerned are found among the gigantic effects that would have followed any lengthened continuance of the strike. Some of the railways for hours each day towards the end of last week appeared to be practically derelict; no signs of life whatever were to be found upon them in many districts for considerable spaces of time. The great interruption of the means of transport would have had, had the strike continued, grave effects upon coal stocks at those gas-works depending upon the railways for supplies, as well as upon the fulfilment of contracts for secondary products. A further effect is to be found in the paralyzation of trade and manufacture; and in the evil consequences of this, the gas industry would certainly have have had to share.

In the settlement, there is one point that has an ominous ring about it for those who have large traffic dealings with the companies; and that is that it has been arranged by the latter (and who can blame them?) that any increased charge for labour that may be, in the result, imposed upon them shall be met by an increase of charges. "The Government "have given an assurance to the railway companies that "they will propose to Parliament next session legislation "providing that an increase in the cost of labour due to "the improvement of conditions of the staff would be a "valid justification for a reasonable general increase of "charges within the legal maxima, if challenged, under the "Act of 1894." From this it may be deduced that whatever costs are involved as the result of the settlement will later on find their way to the shoulders of the public. But the public will be content to have had, at any reasonable price, order restored where chaos, rapine (in places), and the sharpest of animosities reigned during the end days of the past week.

Gas-Workers and Labour Unrest.

The gas industry would have been fortunate indeed if, in the general upheaval of labour, all gas undertakings had escaped. The thought was, however, encouraged that they would, considering that employment in the gas industry stands in good repute among the workers of the country on account of the excellent wages, the permanence of employment for most of the men, and the general conditions and benefits that surround the employment. But it was not to be in the case of certain important undertakings, though now we indulge the hope that reasonableness will prevail, and that these concerns will escape from being plunged into a vortex of difficulty with their men. The gas undertakings principally involved are Manchester and Salford and Sheffield. But the case of Manchester and Salford is totally different from that at Sheffield. This is not the time to say anything that will aggravate relationships, or in any way increase tension. But we do think the Trade Unions concerned at Manchester and Salford have taken a very high-handed proceeding in giving (according to newspaper reports) notice that unionists in the employ of the Corporations will not, after the 31st inst., continue to work with non-unionists. There can only be one meaning attached to this notice—that the non-unionists must either join the Unions, or, in the alternative, out they must go, or out will go the unionists. In other words, the Unions have decided that they, and not the Corporations, are to be masters in this matter of employment.

If we understand the position correctly, the Municipal Employees' Association is the organization from which this particular storm-cloud has sprung; and Mr. J. T. Jones, the Secretary (as reported in our columns last week), has been speaking very plainly as to the intentions of this body. "We have determined that every worker of the Manchester "and Salford Corporations shall stand on the same line." This is pretty strong. "*We* have determined." The employee has turned dictator! It would be most interesting to

know who gave this particular organization the right to dictate to the citizens of Manchester and the burgesses of Salford who they shall, and who they shall not, employ; and who gave them the right to say that the man who is a non-unionist is not to have a place in employment under either Corporation. Things are coming to a pretty pass when unionists arrogate to themselves such rights, and attempt to intimidate such powerful local governing bodies as the Manchester City Council and the Salford Town Council. And where this is happening is in Free Trade Manchester. Free trade in commodities of all kinds, but not free trade in labour! Unionism rules otherwise. Unionism is therefore unreasonable. With a vast mount of interest, the gas industry will wait to learn whether or not the matter will be allowed to fizzle out, or whether, if carried further, the Manchester and Salford Corporations—representatives of a composite body of ratepayers and of opinions—will submit to the ruling and dictation of the unionists, or will refuse to condemn to unemployment any non-unionist servants at the behest of the Unions. The resolution of the unionists is sheer tyranny; and there are hints as to enforcing demands. Bearing on this, Trade Unionists have adopted a revised creed; and the Unions concerned in this matter have subscribed to it. They do not believe in arbitration; they do not believe now in striking in small sections; but they do believe, in order to make a clean job of a conflict, in the potency of numbers. That is the position at Manchester and Salford. The development of affairs will be awaited with interest.

The position is altogether different at Sheffield. The men there are claiming, according to the newspaper reports, that they (labourers excepted) ought to have an increase of 2s. a week in wages, and that the time has come for certain grievances to be redressed. Beyond this bare announcement, we will not go at present; seeing that, at the time of the publication, the Gas Company had not received any notice of the intention of the men to demand an increase in their wages. As a matter of fact, the Sheffield gas-workers are among the best paid outside London; so we cannot see what case the men can put forward in support of an increase. It can only be imagined that the state of general unrest which has arisen in the locality at the present time has prompted the Union leaders to endeavour to raise a spirit of discontent among the Company's men. Whatever the claims may be, whatever the fancied grievances, the men know that upon Mr. Hanbury Thomas, the Managing-Director, and the Engineer (Mr. J. W. Morrison) they can rely for giving to the matter thorough and earnest consideration, and that the Board of Directors will treat it in the same spirit. We hope for the best at Manchester, Salford, and Sheffield; and that, in the former places, the unionist gas-workers will not be so foolish as to plunge into a senseless struggle because some of their fellow workers claim the liberty of being non-unionists, just as the unionists claim the liberty of being members of their respective organizations.

From other quarters, too, came last week the intelligence of the infection of the hour spreading into, and causing a little ruffling of the surface of affairs at, other gas-works—a comparatively few of the men apparently regarding the occasion as a fair one for trying to incite to a request for more money. The Gas Workers' Union are taking hold of the opportunity, as will be seen by a communication in our news columns, for attempting to get the gas workers at Beckton again into the fold. And this is at the bottom of the paragraphs that have recently appeared in certain newspapers suggesting discontent at Beckton. But the fact that the Union have lost their hold upon the men speaks volumes; and the good sense of the men themselves in appreciating their new conditions, is quite sufficient to preserve good-feeling between them and their employers, notwithstanding that among them there may be a few who are susceptible to unionist intrigue, design, and blandishment. The City of Liverpool have been having, as the whole country knows, most unhappy experiences through the attempt of mob law to gain the mastery over all other rights. In such an atmosphere, all sorts of ominous reports were bound to obtain currency. One report was true, that the men at the electricity station left work. In consequence, the tramway system was stopped, the lighting of between six and seven miles of streets out of 460 odd miles was for a time affected; those theatres, music halls, and hotels which had not retained their gas supply, had to close; and private consumers in similar predicament had to find solace in oil-lamps and candles. The loss of their power supply also caused several manufacturers to close-down. Some of the newspapers, quite in conformity with the spirit of the times, spoke of Liverpool being "in darkness"—a condition which, if true, would have brought in its train, in the fever and delirium of the hour, unspeakable horrors. Fortunately, between worse horrors than already obtained and the citizens stood the Gas Company. Following this, rumours were soon afloat as to a possible insurrection of the gas-workers; but we are glad to learn there is no truth whatever in the report, and that the men are perfectly loyal and trustworthy. Paris on two or three occasions has been shown how electricity supply can be made one of the sharp weapons employed in the enforcing of demands at the time of a strike; and Liverpool has again illustrated how readily it can be brought to subserve the rabble with hands raised against law and order. Gas supply is inherently in a stronger position; and, moreover, those employed in gas-works come under the Conspiracy and Protection of Property Act, 1875.

Gas Workers and National Insurance.

THE case of the gas workers, as represented by those companies who have sick funds that demand less contribution from men and employers, and confer greater material benefits than are proposed by the National Insurance Bill, has been mentioned in Parliament. The matter was raised by Sir Henry Kimber, Bart., the representative of the Wandsworth Division of London; and he took, as was seen by the report that appeared in our "Parliamentary Intelligence" last week, the position of the South Metropolian Gas Company as an illustration. The reply of the Chancellor of the Exchequer is the interesting part of the report; but we are not altogether satisfied by it. If the Bill itself is so obscure that we have all been misinterpreting it, then it may be that we are misunderstanding what appears to be the meaning of the reply of Mr. Lloyd George to Sir Henry, that, under the national scheme, the men who are actually receiving more under their existing funds than is suggested under the Bill will be still better off when the national scheme commences working. In order that there may be no subsequent error, we shall be glad to see this condition of affairs made certain by express and plain terms in the measure itself. To this there can be no objection, seeing that the Chancellor has made the pronouncement. These are his words:

> As every penny contributed by employers and workmen under the National Health Insurance will be applied exclusively for the benefit of the workmen under their own administration, it follows that they cannot lose through being brought under the Bill; and since they will have the State grant in addition to their own contributions, it further follows that they must gain. If they can so manage the fund as to provide larger benefits than the minimum indicated in the Bill, they will be in a position to enjoy those larger benefits. I am not prepared to penalize all the best-managed provident funds by withdrawing State aid from them.

No gas worker will want to deprive himself of benefits equal to those, or superior to those, secured by other classes of workers; but every gas worker will be pleased to be shown where there has been misinterpretation of the Bill, and have proper assurance that, after the Bill becomes law, the position will be that pictured by the Chancellor.

The magnanimous and philanthropic spirit underlying the final sentence of his answer: "I am not prepared to penalize "all the best-managed provident funds by withdrawing "State aid from them," indicates that Mr. Lloyd George desires to be regarded as a protector of those who are asking for exemption. This being so, why are "exceptions" made in the case of "Crown or any local or other public authority "where the Insurance Commissioners certify that the terms "of the employment are such as to secure provision in "respect of sickness and disablement on the whole not less "favourable than the corresponding benefits conferred by "Part 1 of the Act?" Surely, the Chancellor is not prepared to penalize the employees under the Crown and any local or public body whose present funds comply with the cited condition by "withdrawing State aid from them" through permitting "exception." There is something that is a little mysterious between the terms of the Bill and the Chancellor's answer. One other point occurs to us. As the gas workers who have raised this matter are well satisfied with their present funds, and as the Chancellor cannot bring himself to withhold State aid from them, he might consider the question as to exemption in respect of the prescribed amount of the contribution on the part of the employers and employed where the benefits under existing funds are superior to those proposed by the Act. In this way, the present benefits could be secured, and through the amount received

by way of State aid, the present contributions of both men and employers could be reduced. Many employers and employed would be very thankful for such assistance. We marvel at the Chancellor not having thought of this before; but we freely make him a present of the idea. At the same time, it may be suggested that he might do worse than inquire how it is that these large gas companies can give, under their voluntary schemes, greater benefits at less expense than the State with all its machinery and resources. Perhaps the machinery and the resources have something to do with the difference.

The Persistent Tale.

The same tale runs all round regarding the past half-year's prosperity of gas undertakings. The Croydon Gas Company, representing one of the remoter Suburban gas concerns, have registered an advance in consumption of 8·36 per cent. The Chairman (Mr. Charles Hussey, J.P.), it will be seen from the proceedings at the meeting of proprietors last Friday, gives a large amount of credit for this good result to the day business; for the growth of consumption is out of all proportion to the increment of new consumers. Additional connections and fresh uses among old consumers have a large part in the present gas boom; and the result during the hot weather has been that at Croydon there has been a substantial improvement in the daily output. The common tale runs in other directions. Greater makes per ton, increased receipts from residuals, lower net cost of coal—all contributing to solidity and an excellent financial issue. The Company, though in the midst of keen competition, never stood stronger than to-day in all the attributes that are essential to offering effective attack and resistance in the commercial campaign. Within twelve months, they have been able to give the consumers three reductions in price, the proprietors are on this occasion receiving an increased dividend at the rate of ½ per cent. per annum; and the employee co-partners are enlarging their interest in the Company as fast as possible, by adding savings to bonuses for investment. Not only are cookers and gas-fires increasing rapidly, but the high-pressure system of shop lighting is greatly gaining in favour among the tradesmen in the main shopping area; and the Directors are confidently looking to a considerable expansion of this system. Mr. Hussey had some philosophic remarks to offer on the use of tar for road purposes. The Company have made a small advance in the price of tar; but they are not prepared to prejudice a young application, and a growing and profitable trade, by holding out for the last farthing per gallon. All this means that the Board have a good adviser in their Engineer and General Manager (Mr. James W. Helps), and that the numerous activities of the undertaking are conducted with vigour and intelligence by the right men in the right places as heads of the various departments.

A Public Lighting Contract at Northallerton.

The Northallerton District Council cannot be complimented on their business methods or their courtesy. The question of a new public lighting contract has been under consideration; and in this matter (though most of the councillors use gas in their homes) the Gas Company have been treated with scant courtesy and in an unbusiness-like fashion. The streets at the present time are lighted electrically. Invitations were sent to both the Gas Company and the Electricity Company to tender for a new contract but the specification was of a kind that, considering what would have to be done by the Gas Company, did not give them much latitude in making a competitive offer. The Council required that tenders should be for the lighting of the whole town, and also for partial lighting, reserving to themselves the right to accept a tender for part of the town or the whole as they determined. What is more, the Council asked for tenders for only two years. This did not give much chance to a Company who, if successful, would have had to convert the street lamps back to gas-lighting. But though the contract period as defined in the invitation to tender was only two years, on the casting-vote of the Chairman a contract for five years was granted to the Electric Company. This was also unfair. Beyond this, the Gas Company made two suggestions to the Council: (1) That lower illuminating power lamps than 800 candles set closer together would be preferable for the main streets; and (2) that the Council should allocate portions of the town to both competitors for a demonstration of effect and cost. The officers of the Gas Company (Mr. T. Harrison, the Secretary, and Mr. B. Calvert, the Manager) would, we are sure, have given a good account of modern gas lighting. We should not, however, like the Council to think gas lighting incapable of going to the higher powers, if suitable. There are gas-lamps, inverted and otherwise, of all sorts of powers, ranging between 90 and 4500 candles, in the streets of London to-day. But Northallerton is not London; and it would be wasteful and uneconomical for Northallerton to do what is being done in London. The suggestions of the Gas Company were ignored by the Council, as, it appears, have been tenders from them on former occasions. Under the circumstances, the Council cannot be congratulated on their courtesy, fairness, or business methods in this matter. Nor do we think the best interests of the ratepayers have been studied.

Road Board and Road Surfaces.

There are some people who expect great things to be accomplished quickly, and innovations to settle down immediately to a condition that suggests long establishment. Such people may expect, but they will rarely realize. Everything must have time to develop itself, and to take its proper place in the world's organism and equipment. This applies even to the Road Improvement Board, over whose work in the short span of their existence complaint has already arisen. The complaint has found its way into Parliament; and the grievances have been aired there. There seems to be a large amount of dissatisfaction without much cause. The initial work of the Board has been to consider applications for grants for urgent road improvement; and with a revenue of about 1 million to deal with, applications were made for grants to the total of 7½ millions. Result, dissatisfaction in many parts of the country. Then motorists are not altogether pleased with the way some of the money is being expended. The first work they consider should be effectively taken in hand is the improvement of the road surfaces, and not such improvements as the easing of sharp corners and so forth. When motorists originally agreed to the tax that furnishes the funds, they were actuated by a desire to wipe away the feelings of indignation and resentment caused by the clouds of dust created by their cars. This undoubtedly is the direction in which the money should be first expended—in making the highways such that cars can be used without creating nuisance. As Mr. Hobhouse indicated, when the matter was before the House of Commons, what is generally first wanted is the improvement of the crusts of existing roads; other work, such as new roads and making straight any crooked but much-patronized ways, should come afterwards. The original trouble that gave birth to the Road Board is what has to be first encountered and dealt with.

A Good Surface an Essential Condition.

Another complaint came from those who consider that the fish in the streams of the country require protection as well as human beings. We agree; but we place the claims of the latter before the former. It is alleged—the evidence is not very widespread or striking—that fish are being poisoned by the washings of tarred roads. This is a matter that is susceptible of remedy in the neighbourhood of streams by the use of tar complying with one of the specifications of the Board's advisers. It has come to this that (as pointed out in the House by Sir C. Rose, one of the members of the Board) the question of binding the surfaces of roads has got beyond the experimental stage. Now it is a necessity that has grown with the modern means of locomotion. It is essential for the protection of the community; and highway authorities are agreed that the more they can keep road surfaces united by the employment of a binding substance such as tar, the less liable are the roads to wear and break-up. Therefore what is being done is an economy in road maintenance. It is all too early yet to criticize the Road Board. The time to adversely do this will be after they have had sufficient opportunity to get into proper running order, and when, if ever, they show incompetence under the settled conditions. At the moment, we are prepared to say that the Board are working quite up to most people's expectations; and what is important is that tar has been selling well for road purposes, at very decent prices. This year, and its dust lessons, should assist in the principal primary work of the Board—that of hastening forward with all speed the improvement of the surfaces of roads.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 499.)

In such a general upheaval of social and commercial relations as disturbed the whole country last week, it was only to be expected that business on the Stock Exchange should suffer. Very great depression prevailed in most markets, though Consols fortunately met with some support from influential quarters. Railways were naturally in a very bad way. Added to our home troubles, Americans had a severe set-back. To cap all, the settlement of a long nineteen-day account had to be faced—an insuperable task for some, which resulted in four or five failures. The disastrous week closed on Friday; the Exchange being shut on Saturday. The opening day was heavy and depressed, with little found anywhere that was calculated to mitigate the gloom. Government issues were weak, and Consols fell $\frac{3}{16}$. Rails were, of course, the worst, in view of the aggressive attitude of those who figured as the strike leaders. Americans showed fresh weakness. On Tuesday, the strike news received up till closing time being more favourable, a better feeling prevailed. Consols sprang up $\frac{5}{16}$; and Rails made a nice improvement. But on Wednesday morning, the outlook was quite bad again; and down went prices, although not very seriously. Thursday opened in somewhat hopeful mood, but business kept very quiet. Gilt-edged things were steady, and Rails were rather stronger; the critical situation not being known at the closing hour. Friday was very heavy and dull. There was little disposition to deal at all with public affairs in such a state; and the usual move to realize tended to help to depress markets. In the Money Market, the tendency was stronger; rates both for short loans and for discount ruling firm. Business in the Gas Market was on a very fair scale, considering the holiday season and the short week, and the market was very strong. A large number of issues varied their quotations either on advanced values or on *ex div.* adjustments; and, with one exception (influenced by special circumstances), all changes were in the upward direction. In Gaslight and Coke issues, the ordinary was in good request. Transactions *cum div.* ranged from 108¼ to 108¾, and *ex div.* from 106 to 106¾—equivalent to an advance of ⅜. The secured issues were quiet; the maximum marking 84½ *ex div.*, and the preference 102⅝ *ex div.* South Metropolitan was very quiet, and changed hands at 119¼ free and 120 *cum div.* and 117⅜ *ex div.*—a rise of ¼. In Commercials, only the 3½ per cent. was dealt in, marking 108½ and 109 *cum div.* and 106¾ *ex div.* Among the Suburban and Provincial group, British was done at 45 and 45$\frac{3}{16}$, and no other was dealt in. But a large number rose in price, including Bournemouth, Brentford, Chester, Newcastle, Sheffield, Tottenham, Tynemouth, and Wandsworth. In the Continental companies there was little business done. Imperial marked from 181 to 182, European from 19$\frac{1}{16}$ to 19½, and Union preference 136¾. Among the undertakings of the remoter world, business was confined to South American adventures. Primitiva realized 7$\frac{7}{16}$ and 7$\frac{15}{32}$, ditto preference from 5¼ to 5⅜, San Paulo 21¾ and 21⅞, and ditto preference 12¼ and 12⅜.

ELECTRICITY SUPPLY MEMORANDA.

Pigmy Efforts against a Mountain of Facts—Seabrook on the Wholesale Poisoning of Inmates of Dwelling-Houses and the Tainting of Food—Gas-Fires and Impure Air—The "Electrician" on the Struggles, Dread, and Extremity of the Gas Industry.

A few words with Mr. A. Hugh Seabrook, the Engineer and Manager of the Marylebone Electricity Supply Department. An article has appeared in the "Electrical Review" with his name at the head, and bearing the title of "The Coming Electrical Exhibition." But the article is practically from beginning to end an abusive attack on cooking by gas, and a fulsome laudation of cooking by electricity. Mr. Seabrook is one of those electricians who believes in attempting to develop business in his own particular commodity, by adopting the fulminatory process in regard to his competitors. We are not going to particularly criticize his article on this occasion; but, in view of its publication, he will not object to going a little farther, by putting us in possession of the proofs on which he founds his assertions. It is only fair that he should do so; and that he should disclose the real substance on which he relies for his ambiguous and dogmatic assertions. His colleagues and the Editors of the "Electrical Review" will, by his reply, and by the criticism it will receive, be able to judge of the strength of his case. A very few questions will suffice to put us in possession of all we desire to know, in order to follow the matter up with Mr. Seabrook. He is dealing with the gas-cooker; and he puts this question: "Are not the products of the combustion of gas—permeating as they do the whole house, and *poisoning its inmates*—far more harmful than a little more smoke coming from the domestic chimney?" Mr. Seabrook uses the words "poisoning the inmates." Considering the millions of gas-heating appliances that there are in use in the country, what wholesale poisoning there must be going on—if he is correct! We want his evidence as to the poisoning. This is the first information that is required. Then to poison the inmates of houses, poison must exist. Given a gas-cooker properly used, what are the "poisons" that are given off, and what are the amounts? These are the next points on which information is needed.

A little further on there is the suggestion that food cooked in a gas-oven is tainted. The exact words are: "Now what do we offer the public? A cooker which will cook as cheaply, better, and more quickly than gas, and which will not *taint the food cooked* or *poison the air* of the place where cooking is carried on." Mr. Seabrook will oblige by telling us in what manner the food is tainted. He will, of course, also kindly produce evidence as to the tainting, and give an opportunity for someone to be present to ascertain the conditions under which the tainting is produced. It is observed that Mr. Seabrook is "profoundly disgusted that arrangements have not been made for the Exhibition caterers [at Olympia] to use electricity for all their cooking during the show." This suggests that gas will be used; so that there will be plenty of opportunity to test the tainting of which Mr. Seabrook speaks. We have sat down with electricians to several dinners cooked by gas, and never a murmur from them as to gas-tainted food. Representatives—representatives in high place—of the "Electrical Review" have occasionally been among the guests. The proof of the pudding is in the eating. There has never been noticed any failure of our friends' gastronomic powers through the tainting of the food. At the last Electrical Exhibition at Olympia, the caterers used gas for their culinary operations; we heard no complaint, nor had we or any of our friends who visited the exhibition any complaint to make as to gas-tainted food. Mr. Seabrook has enjoyed many a meal cooked by gas. Apparently he has even used gas in his own house for cooking, seeing that he says: "I suppose most of us have used gas for cooking at some time or other." We have seen this gentleman on many occasions, and really he looks healthy enough, though, if we interpret his words properly, he has been stupid enough at some time or other to submit himself to the poisoning process of which he speaks. "Are not the products of combustion of gas—permeating as they do the whole house, and poisoning the inmates—far more harmful, &c." Would it not be well for electricians to stick to facts; and not adopt such foolish and crude arguments that their own palates have disproved many times, and are doing day by day. As to the cost of cooking by gas and electricity, Mr. Seabrook is a little less assertive in his remark that "we know now that electricity can equal and *sometimes* beat gas in cost of cooking." That is admirable; and it is certainly tame considering its source.

There is a further question; and as this is a positive statement, Mr. Seabrook will do us the favour of expatiating on it a bit, in order to explain in what way gas-fires affect the purity of the air of rooms. He says: "When we get to gas-fires for warming, the position is *far worse as regards impure air in rooms*." If we accept his dictum, then there is nothing at all wrong with the use of gas for cooking. It may be presumed that Mr. Seabrook has personally conducted some scientific tests with gas-fires before penning such a statement as that—tests equal in the precision of method to the scientific ones that have been conducted at the Leeds University and at Glasgow, though we cannot admit that Mr. Seabrook's capacity for carrying out such experiments is on the same level as that of the men who conducted the researches to which we refer, and whose *bona fides* we do think Mr. Seabrook will be prepared to question. However, we ask him to produce a description of the character of his tests, and the results, to set alongside those of Leeds University and Glasgow. There is one further gem in the article that must be reproduced. It is worthy of a wider circulation than has been accorded it by the "Electrical Review." Here it is: "I *sometimes* tell my consumers [Mr. Seabrook evidently weighs the intelligence of the person with whom he is speaking before he gives vent to this], when advocating electricity for everything, 'it is barbarous to permit a crude chemical operation, such as combustion, to be carried on in your house. Such things should be done under proper supervision and control, in properly constructed apparatus, as in an electric power house. We give you a pure and finished article, ready for immediate use, not a crude chemical product, which *you have got to do a lot to before it is of any use to you. You are not a chemist; and unless you are, you cannot use gas without injury to your health and that of your family.*'" We will not comment at length on this choice piece of Seabrookian philosophy. Many a gas consumer will know the proper designation to apply to the author of such nonsense; and we leave it to his friends to endeavour to digest it. But this from a single electrical engineer after the world's experience—the experience of countless people in countless homes—during a century and a decade with the combustion of gas! All the time, the poisoning process has, according to Mr. Seabrook, been actively going on. Is it not all very absurd when examined in the light of what has been done? The fact is the popularity of gas, the growth of its consumption, the increasing financial strength of the gas industry as seen by the accounts that are week by week being published, the consequent greater strength of gas in competition with electricity, are stinging our competitors to an extent that makes them more and more reckless in their statements. Gas-fires and gas-cookers are going in by their thousands year by year in the Metropolitan and other areas; and electric radiators and electric cookers are not. That is where the trouble comes in. But we will not pursue the subject, until we have definite answers to the definite questions addressed to Mr. Seabrook. In framing his answers, we hope that he will take the conditions produced by modern gas cookers and fires, and not antiquated ones. It is with the newest types that the gas industry is making such rapid progress in the cooking and heating business.

The omniscient one of the "Electrician" has again spoken. He has in times past accused us of being incapable of appreciating humour. That was an injustice. We have laughed and laughed again over an article of his, headed "Can it be Possible?" It is almost as bad as the sanguinary spectacle that the dear old "Electrical Review" once presented us with of the gas industry in its death throes in the last ditch. We are almost inclined to reproduce the "Can it be Possible?" article as a delectable titbit for holiday reading; but perhaps a few quotations will suffice. Here is a choice piece with which to start: "In the case of gas, the realization of the knowledge of the ultimate result of the struggle must be somewhat fateful, like the classic sword of Damocles over the heads of the contestants." The penetrative power of this remarkable writer in the "Electrician" courts our admiration. How on earth he managed to penetrate the growing prosperity of the gas industry and to discover at the back of it all a realization of "the ultimate result of the struggle," pass our comprehension. Perhaps our expression "omniscient" as applied to him is a little too strong, for we see that he is not prepared to discuss "at the moment" the "time appointed for the falling of that sword." He would confer a great boon on the stockholders of the gas industry if he would exercise his superhuman powers, and tell us approximately when the great catastrophe is to come. To proceed: "The development of the struggle between the two illuminants, particularly in the past twelve months, has witnessed a consistent advance of electricity side by side with the adoption of tactics by the gas adherents which can only be attributed to the promptings of despair." "The promptings of despair!" Has the "Electrician's" omniscient one been studying lately the gas accounts of the gas industry? Has he found the "promptings of despair" in the increased revenue derived per ton of coal carbonized (at lower prices for gas than ever ruled before), through the advances made in scientific carbonization, and the increased demand and consequent higher market values that exist for the secondary products? Has he noticed how, through these things, prices for gas are being reduced all round, how consumption is increasing, how connections of gas consumers, of gas fires and stoves, and water-heating apparatus are increasing in number, how full statutory dividends under the sliding-scale are being paid, and how the sums carried forward are of substantial amount, with reserves and depreciation well looked after? Where are the "promptings of despair" to be found in these conditions? The policy of the gas industry is to press forward; not to stand still. Hence its activity.

Ah! but there is the Electrical Exhibition at Olympia. While our friend "looks forward to it with confidence, the gas interests cannot but regard it with the utmost dread." The gas industry will not shiver over such frail and vacuous talk. "We *appear* to hold several trump cards in the game we are playing." Appearances are sometimes deceptive. Further on, we observe that the all-seeing faculty of this writer occasionally diminishes; for he remarks that "it is difficult to conceive that the cost of gas-consuming devices can be reduced very much lower than it is at present." From which it must be taken that in the view of this electrical writer, in the matter of the production of gas appliances, efficiency and economy have reached their utmost limits. Being "reduced to this extremity, the gas industry is occupying itself in the attempt to discover some means of stemming the tide in favour of electricity." Here is found the secret of the title of the article "Can it be Possible?" It all amounts to this, that, through some inexplicable lapse of omniscient powers, the writer in question has only just discovered that efforts are being made to secure for large consumers of electricity the economy to be derived from the adoption of gas-driven dynamos on their own premises. This is denounced as "a crafty manœuvre," which "does not deserve to succeed." We do not care what it is called by this electrical journalist; but we call it legitimate business. The answer to this question "Can it be Possible?" is that not only is it possible, but it is being done with profit to gas undertakings and large electricity consumers. In our contemporary, the article succeeding the one upon which comment is made is, it may be noted, headed "Efficient Grinding."

Mr. T. R. Stancombe, of the Yorkshire Electrical Power Company, appears to be sadly misinformed. The public lighting of Kirkburton is in question; and the Electric Power Company want the business. A "Ratepayer," in the "Huddersfield Examiner," has controverted the statements made by the electrical partizans. Among his statements he very properly said the incandescent lamp is a better diffuser of light than the electric lamp. Mr. Stancombe comes along, and makes the following remarks:

> Tests can be made with a street photometer, which prove that the diffusion of an electric lamp is greater than the incandescent gas-lamp (new inverted type), and this is owing to the fact that the maximum light from an electric metallic filament fitting is given off horizontally, due to the filaments in the lamp being vertical, whereas with the gas-fitting the maximum light is given off at an angle of 30° from the vertical, throwing the majority of the light directly around the column. It is clear, therefore, that the light from an electric lamp is diffused a far greater distance than with the incandescent gas.

Has Mr. Stancombe never heard of the Holborn tests, in which the Electric Light Company put in competition lamps of higher candle power than the Gaslight and Coke Company considered sufficient. Even by having electric lamps of between 70 and 80 candles higher illuminating power at the source, the Electricity Company failed to get any better distribution—in fact, the lower candle-power gas-lamps gave a superior result. Referring to this matter at a meeting of the Borough Council on March 8, Alderman Max Clarke said:

> With regard to the statement made by the Committee, that "tests of the lighting were taken photometrically at frequent intervals from Dec. 20 to Jan. 17, with the result that the electric lamps were found to be giving an average of 395-candle power each, and the gas-lamps 318-candle power," they explained that these results were obtained from readings taken at certain specified angles; but they said that "on a further test being made at equal distances along the centre of the road, the illuminating effect was found to be about equal for both forms of lighting." When this question of the testing at 20° and 50° and down the centre of the roadway was mentioned to the Electric Light Company, another set of tests was made, and plotted in a diagram, and with this the Company agreed—proving the correctness of the former tests, that down the centre of the roadway *the gas lighting was superior.*"

Now what has Mr. Stancombe to say to this? Is he prepared to assert that the Works Committee of the Borough Council, those who made the photometrical tests, and the Electric Light Company did not know what they were talking about, and are a set of asses? We like the same gentleman's little artifice in quoting the change-over from gas lighting to electricity in the areas of Borough Councils in London where the electricity supply is run by the authorities. Why did he not quote the condition of things in other districts where both gas and electricity are run by companies? By so doing, he would have had a fair parallel with Kirkburton. But he does not dare to do so. Stay, he refers to Westminster, and says that there some 1100 electric lamps still exist that were originally changed over from gas. He does not state that the greater part of these lamps represent a contract entered into by the St. George's (Hanover Square) Vestry in their expiring hours—just before the district was merged in the City of Westminster—and that the Chairman, whose casting vote carried the contract, mentioned only a few months since in the City Council that had they known, when the contract was entered into, what was going to happen in connection with gas lighting, it would never have been signed and sealed. Does Mr. Stancombe want chapter and verse for this? We hardly think he will regard it as helping his case much.

It is much easier to get the Northumberland clause—the revised version of the Bermondsey one—inserted in local authority Acts and Provisional Orders dealing with electricity supply than was at one time the case. The pitiful plea that used to be advanced as to the electricity industry being in its infancy can no longer be decently made—at all events, can no longer be made without exciting ridicule over the long continuance of the industry in its tender state. The Rhondda Urban District Council, in the Bill they have had in Parliament this session, sought electricity powers. They have obtained them; but with the stipulation that the price is to be periodically revised, so that the receipts and expenditure on the undertaking balance as nearly as possible.

Vienna Corporation New Gas-Works.

An account of the new Leopoldau works of the Vienna Corporation, which are designed for an immediate make of 40 million cubic metres (about 1415 million cubic feet) of gas per annum—with extension ultimately to a productive capacity of 200 million cubic metres (about 7060 million cubic feet) per annum—states that they should be ready for use this autumn. The gas made, however, is to be received provisionally in a gasholder on the works, and pumped from it by means of a turbine blower through a wrought-iron main under high pressure to the large gasholder in the Brigittenau district, from which it will be distributed in the new area of supply which the Corporation take over from the Imperial Continental Gas Association, and the Austrian Gaslighting Company, on the 1st of January next. It is this large holder at Brigittenau which has failed, as noted elsewhere in to-day's issue. The contract for the new holder was placed about October, 1909, with the Augsburg-Nuremberg Engineering Works, at the same time that a contract was settled for a gasholder at the Leopoldau works, of 150,000 cubic metres (5,300,000 cubic feet) capacity, with the firm of Pauker and Son, of Vienna.

Presentations to Ilford Gas Company's Officials.—On Friday, the 11th inst., a meeting of the staff of the Ilford Gas Company took place, at which presentations were made to Mr. B. G. Old and Mr. B. L. Pratt in recognition of their approaching marriages. The Assistant-Engineer (Mr. T. F. Canning) made the presentations, which in each case consisted of a handsome timepiece bearing an inscription, and expressed the best wishes of the donors for the future happiness and prosperity of the recipients.

The Catskill Water Supply will be distributed to New York City from a deep pressure tunnel in rock, reached by twenty-five shafts, varying from 180 to 300 feet in depth. The risers and appurtenances for connecting the tunnel with the city's distributing mains were described substantially as follows by Mr. Thos. H. Wiggin in a paper submitted to the Engineers' Club of Philadelphia. The shafts will be closed by a concrete plug beginning at least 100 feet down in solid rock. In this plug one or two steel pipe risers, lined with concrete about 5 inches thick, will be embedded. At the lower end of each riser is a pear-shaped bronze plug valve, operated by a lever and rod, running to the surface. The plug shuts with the pressure, and is held open by its own weight; the rod is released by a magnet.

A GOOD ADVERTISEMENT FOR HIGH-PRESSURE GAS.

One Hundred and Eleven Electric Arc Lamps Displaced in Two Roads.

We have had several indications recently of the trouble that high-pressure gas-lamps are giving to electricians; and of the popularity that a high-pressure system of gas lighting in main streets has attained, and is further attaining, among tradesmen. The discussion at the recent meeting of the Incorporated Municipal Electrical Association showed, with strong emphasis, which way the wind was blowing, and the effect that high-pressure parade lighting was having on the electrical competitors. The Brentford Gas Company are actively pushing the system in their district; and the result is seen by the following advertisement in the "West London Observer." It is the best possible advertisement the Company could have; and it will be useful to them as a peg upon which to further press home the advantages of the system.

Don't be Talked into Installing High Pressure.

--ELECTRICITY--

IS LOW PRESSURE AND THE . . . .

SAFEST, BEST, AND CHEAPEST OF ALL ILLUMINANTS.

LANTERNS FIXED AND MAINTAINED By the Borough Council on Easy Terms.

APPLY—

Engineer and Manager,

85, Fulham Palace Road, Hammersmith, S.W.

The Company are now putting down a 10-inch high-pressure main in the chief thoroughfares of Hammersmith; and the Borough Electrical Engineer found it necessary to call the attention of his Committee to the keen competition he was having to meet. As a result, the Electricity Committee reported to the Council to the following effect: They had for some time past had under consideration the question of advertising to bring the uses of electricity before the public. Up till then the only monies spent on publicity had been £156 per annum to a canvasser and £50 per annum for literature, &c. They were now strongly of the opinion, having regard to the active methods pursued by the Gas Companies, that it was advisable to spend an amount of not less than £300 per annum for this purpose (including the salary of the canvasser). The recommendation was agreed to by the Borough Council. The foregoing advertisement is the first fruit; and, as we have said, is one of the best possible advertisements the Electricity Department could have given the Gas Company.

We learn that the Company have recently replaced electric arc lamps with high-pressure lamps, 38 in number in Askew Road, and 73 in number in Uxbridge Road, Shepherd's Bush, which is in the area supplied with electricity by the Hammersmith Borough Council. This is good work.

Scottish Tube and Oil Companies.

It was announced in Glasgow on Monday of last week, that an agreement had been come to whereby eleven Scottish tube-making companies would be amalgamated under the title of "The Scottish Tubemakers, Limited." According to a correspondent of "The Times," the capital of the new Company will be £600,000; and that though the most important of the tube companies—Stewarts and Lloyds, Limited—will stand outside the combination, it will work in harmony with it, and will not only subscribe for a block of ordinary shares of the Company, but will be represented on the Board. A movement is on foot for the amalgamation of the four leading oil companies—the Pumpherston, Young's, Broxburn, and the Oakbank. Details of the scheme have not been made public; but it is stated that the purchase price has been provisionally fixed at £3,000,000. The total issued capital of the four Companies is, in round figures, £1,900,000; and the ordinary portion of it stands at a substantial premium. A Committee has been appointed to draw up a scheme of amalgamation for submission to the shareholders of the different Companies. The position of the oil industry, though much harassed by competition, is by no means unsatisfactory; but it is thought that it can be greatly improved by concentration of management.

OBITUARY.

The "Journal für Gasbeleuchtung" reports the death, on the 13th ult, of Herr E. Kunkler, Assistant-Manager of the Geneva Gas-Works, at the age of 47. Herr Kunkler had his first experience in the gas industry as an Assistant at the St. Gall Gas-Works. He was then for five years Manager of the lighting and water works at Biel and Interlaken, and then acted as Clerk of Works at the construction of the Langenthal Gas-Works, from which position he passed to Geneva.

Mr. Peter Hurll—whose absence from the annual meeting of the Irish Association of Gas Managers at Cork on the 8th inst. was noted, and a message of condolence with him in his severe illness sent to him—died at his residence at Woodneuk, Gartcosh, Glasgow, on the 14th inst. Mr. Hurll's ailment was paralysis. He was in his 70th year. He was of the firm of Peter and Mark Hurll, manufacturers of fire-brick, furnace blocks, and gas retorts and fittings. Mr. Hurll was fond of attending meetings of gas managers, at which his cheery disposition made him a general favourite.

Much sympathy will be felt for Mr. and Mrs. George Lane, of Aylesbury, who have just sustained a severe bereavement by the sudden death, at the early age of 23, of their younger son, Mr. George Theodore Lane. Some eighteen months ago, he had to undergo an operation; and subsequently from time to time the advice of specialists had to be sought, and further operations performed. In the hope that a change would be beneficial, Mr. Lane went to stay at the house of a friend at Twickenham, where, on the 13th inst., about midday, a serious development of his complaint took place; and he succumbed a few hours later. Mr. Lane's commercial life commenced in London in the offices of Mr. Ernest L. Burton. He subsequently studied chemistry and engineering, and went through the workshops and offices of Messrs. Gibbons Bros., of Dudley. Seeking increased knowledge, he paid a visit to the Black Country, where he passed through all stages of his work. He so far advanced himself as to be entrusted with the charge of works in Caen and Antwerp; and his other engagements included the preparation of plans and estimates for works in Japan and New Zealand. He had travelled a great deal; his journeyings taking him into Palestine, across the Sahara Desert, into Egyptian territory, also to Italy, Algiers, and many other places. He had contemplated making a further trip to the Nile in the autumn. The funeral took place last Thursday at Aylesbury Cemetery. It was attended by many personal friends and several of the employees at the Aylesbury Gas-Works, of which the father of the deceased, as most of our readers are aware, has for many years been Engineer and Manager.

We regret to learn, from New Zealand papers just to hand, of the death, on the 7th ult., at the age of 61, of Mr. Henry Birch, for many years Engineer of the Wellington Gas Company. Deceased had been for some time in ill-health; and, with the view of relieving him of some of his duties, Mr. Archibald Dougall, the Chemist and Second Assistant at the Hull station of the British Gas Company, was not quite two years ago appointed Assistant Engineer. Mr. Birch was a native of London, and went out to Australia with his parents when a child. Proceeding to New Zealand, he entered the service of the Wellington Gas Company in 1875 as a fitter. Four years later he was placed in charge of the Company's outside work, was appointed foreman of works in 1880, and engineer in 1897. This position he retained until the beginning of last year, when he retired from active work, and took up the position of Consulting Engineer. He leaves a widow and a grown-up family. At the funeral, there was a large attendance of sympathizing friends of the family, as well as members of the Gas Company's staff and of various friendly societies; while the floral tributes included wreaths from the directors, manager, and departments of the Company, some of the staff of which and members of the Wellington District of the Ancient Order of Foresters (of which the deceased was Treasurer) were pall-bearers. In 1907, he was a delegate to the High Court of the Order, held at Leeds; and when on the trip he made arrangements for the construction of the Gas Company's large holder, which has been erected at Miramar. He was a man of considerable ability, and was regarded with high esteem by all with whom he came in contact.

PERSONAL.

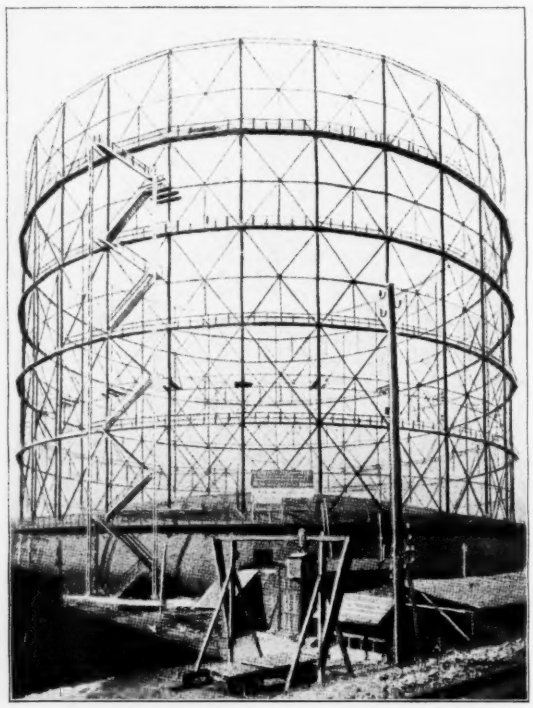
It is reported that on July 1, Herr C. Kohn, the Manager of the Frankfort-on-Maine Gas-Works, celebrated his fifty years' jubilee as a gas engineer. The event was, at his own desire, not announced beforehand; but it received recognition in the bestowal on him of the Order of the Red Eagle of the Fourth Class. All Herr Kohn's colleagues in the gas industry will join in wishing him a further long continuance of his activities.

The "Journal für Gasbeleuchtung" announces that last Wednesday Herr Alex. Bethe, of Magdeburg, celebrated his eightieth birthday. He is one of the oldest representatives of the industry, having entered the service of the General Gas Company of Magdeburg in 1864, and having since, with interruptions for military service in the campaigns of 1866 and 1870-71, been connected with that and other gas undertakings. He is now President of the Board of the Company, and is also on the Board of the German Continental Gas Company.

FAILURE OF THE LARGEST GASHOLDER ON THE CONTINENT.

THE "Neue Freie Presse," of Vienna, in its issue of the 5th inst., contained an announcement that the new holder at the Brigittenau station of the gas undertaking of the Corporation of Vienna had failed while being tested with air prior to being brought into use. This holder is of 250,000 cubic metres, or about 8,830,000 cubic feet capacity, and is the largest so far erected on the Continent of Europe. From the annexed view of the holder when nearing completion, it will be seen that (unlike most of the gasholders of the Vienna Corporation) it stands in the open, and has a bulged steel tank. The following is a translation of the report of the accident.

An accident, which nearly cost twelve workmen who were engaged on the bell their lives, has this afternoon (Aug. 4) befallen the Vienna Corporation's new large gasholder, the erection of which was just finished in the Brigittenau district between the Forsthaus Strasse, the Schwedengasse, the North-West Railway Strasse, and the Danube Canal. In the trial filling of the holder with air, which was pumped into the bell by a blower, the roof of the bell suddenly broke loose and rolled down with a great clutter into the water-tank underneath. The twelve workmen engaged on the roof were able to escape in time on to the guide-framing, and so save themselves.



Gasholder, with the Augsburg-Nuremberg Works' Bulged Tank—8,830,000 cubic feet capacity—at the Brigittenau Gas-Works in Vienna.

The Manager of the Corporation Gas-Works, Herr Menzel, has made the following statement in regard to the accident: In the testing of the holder, which had previously taken place twice without the least hitch, there suddenly occurred to-day a deformation of the topmost ring of the bell. The result of this was that the roof of the bell was ruptured, and the air contained in the holder rushed out. The bell of the holder rapidly sank into the water-tank; and, in so doing, it was further knocked about. The water-tank and the guide-framing remain perfectly intact. No one was injured. Those who were at work on the testing were able to escape in time on to the gallery going round the framing. The damage done can only be approximately reckoned at over 100,000 kronen (£4170). This does not, however, fall on the Vienna Corporation, but on the constructing firm, which is the Augsburg-Nüremberg Engineering Works ("Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft," frequently abbrievated to "M.A.N."), whose previously erected gasholder (of some 5,300,000 cubic feet capacity) at the Simmering works in Vienna has worked without a fault.* The holder to which the accident occurred to-day is the largest of this type on the Continent. It would contain 250,000 cubic metres (8,830,000 cubic feet) of gas. It is 260 feet high, 279 feet in diameter, and its circumference is 820 feet. Inside the gas-bell is a large water-tank, on which there is a punt for use by the staff. Such accidents happen extremely rarely, but are not altogether unavoidable. Even if the statical calculations are quite in order, it is possible that a small error may occur in the execution of the construction, or that such a mishap may ensue from the use of unsuitable material. It was fortunate that the workmen heard the buckling of the iron sheets in time, and fled. This accident will cause a delay of several months in taking over the holder. It will now be necessary to take to pieces the whole framing and the bell, and construct them afresh. The supply of gas to the Dobling district (for which this holder was intended) will not be affected by the delay in its construction. The gas for the district will be drawn from the Leopoldau works.

With reference to this report, the "Journal für Gasbeleuchtung" of the 19th inst. quotes the following from a technical authority: "We cannot fall in with the view put forward in the paper that such accidents are unavoidable. The fundamental rules for the static calculation of tanks, guide-framings and bells can now be laid down without any question. With proper care and, in particular, by taking account of an adequate margin of safety, an occurrence such as has been described cannot happen. From the short and not quite clear exposition given, the technical man will draw the following sketch of the event: The bell and telescoping lifts were raised with air for testing. This obviously relieves the rafters of the roof of load. As the angle-ring of the roof has collapsed, it can only have occurred because this angle-ring, with the connecting parts attached to it, has not proved safe enough for the roof of the bell. It cannot have been the roof which fell in; but the upper lift or bell in any case must have fallen into the tank after deformation of the ring, and thereupon the rest of the bell fell. The telescoping lift then followed as a matter of course. If the occurrence took place thus, the only explanation of the accident which could be found was that there had been some error in the static calculation. Faulty material cannot alone have caused such a collapse. The technical man must consequently assume either that incorrect premises were taken for the static calculation, or that the calculation has not allowed a sufficient factor of safety, especially in regard to the breaking strength of the top curb of the bell."

In regard to this opinion, the "Journal für Gasbeleuchtung" observes that clearly it depends only on an assumption, and that for investigating the matter it is eminently desirable that the static calculation should be made public. Our contemporary expresses its readiness to publish the calculations, so that technical men, and the members of the Gasholder Committee of the German Association of Gas and Water Engineers in particular, should have an opportunity of discussing them. We are only too glad to endorse this plea of the leading German gas journal for publicity of the calculations on which the dimensions of the structural parts of the collapsed bell were based, and for our part will undertake if they are placed at our disposal to publish them, so that English consulting and constructional gas engineers may also be in a position to discuss them. Our contemporary observes further that experienced gasholder constructors attach great importance to the strength of the top curb in large gasholders, because the proper action of the bell depends primarily on the safe design of this curb. In the case of the Hamburg gasholder disaster, investigation of the calculations showed that they were based on rules or formulæ which had until then been regarded as acceptable, but which now must not be employed, because the margin of safety then introduced had been shown to be insufficient. Not only in the general interest, but in that of the gas industry especially, it is of the greatest importance (our contemporary continues) that the present matter should be thoroughly investigated. Such incidents are apt to cause difficulties in securing new concessions. It cannot, therefore, be too strongly urged that occurrences of this kind should be properly investigated, in order that a repetition of them may be avoided. We need scarcely add that we are in hearty accord with the tenor of these remarks.

A report of the accident in the "Zeitschrift des Vereines der Gas- und Wasserfachmänner in Oesterreich Ungarn," of the 15th inst., states that the disaster occurred on Friday, the 4th inst., and caused great damage to material, though fortunately no one was injured. The holder was at the time undergoing the prescribed testing for soundness; and for this purpose it had been filled with air to raise it to its highest position, as had also been done a few days previously. While men were engaged in applying soapsuds to the riveted seams, the top lift gave way. The curb, from some not yet clearly ascertained cause, doubled up, and the crown of the bell folded over the indented place. The air streamed out with great velocity from the opening caused by the breaking away of one of the sheets. The bell sank rapidly; and as several of the axles of the guide-rollers had been sheared off, it was forced against one side of the guide-framing. The latter, and the iron water-tank, remained quite uninjured. The reconstruction will be put in hand as soon as the cause of the giving way of the bell has been clearly established; and probably the holder will be ready tor use at the specified time. It is intended for the storage of the gas made at the new Leopoldau works of the Corporation of Vienna. The loss caused by the accident will not fall on the Corporation. The "Zeitschrift" promises to report in a subsequent issue more fully on the accident and its cause.

* An illustration of this 5,300,000 cubic feet gasholder, of similar construction, at the Simmering (Vienna) Gas-Works (and which is stated to have worked quite satisfactorily) was given in the "JOURNAL" for July 19 last year, p. 201.

FOUR YEARS' EXPERIENCE OF VERTICAL RETORTS AT COLOGNE.

By Dr. F. Leisse, Chemist at the Cologne Gas-Works.

The twelve beds of vertical retorts which were brought into use at the Cologne Gas-Works on June 6, 1907, and the further twelve beds started two months later, constitute one of the first extensive installations of Dessau vertical retorts; and it is now opportune to review the experience gained in four years' working of them. This has been done by Dr. Leisse in a communication made to the "Journal für Gasbeleuchtung" of the 12th inst. The following is a summary of the contents of his article.

The reports of practical experiences, theoretical disquisitions, and long calculations, which have distinguished the contest between the modern systems of gas-making settings, have left the gas engineer a prey to new doubts and unsolved questions. The author hopes, by giving practical working results, obtained at Cologne in the course of the last four years, to throw light upon the subject for his colleagues. The installation at Cologne has been described by Herr Prenger, the Manager of the gas undertaking [see "Journal," Vol. XCVIII., pp. 810, 1000; Vol. CII., p. 562.] It may be mentioned that the experimental plant at Cologne is intended for a daily make of 140,000 to 175,000 cubic feet, and the apparatus may be connected either with two settings of the vertical-retort installation, or eight settings of the inclined retort plant. It is thus possible to obtain direct comparative figures of the working results of the two types of plant by the use of this special experimental apparatus.

Westphalian coal only has been carbonized during the four years; and it has been a mixture from ten different pits. At first, the carbonizing time was eleven hours; but after about nine months this was extended to twelve hours, with the object of increasing the make of gas and of preserving the retorts, which in places were becoming unsound and showing signs of deformation due to overheating. The transverse walls in the heating passages were altered, and aprons were introduced between the retorts in order to effect better control of the heating of the settings. After these changes, the retorts displayed throughout their length a uniformly diminishing temperature, and there were no brighter rings at different levels. The empirical methods of controlling retort-settings which formerly sufficed are not adequate for vertical retorts, which require greater care and more scientific control. The ordinary regulation of the heats of the settings is chiefly effected through the flue and primary air-dampers. The supply of secondary air is kept constant. The setting of the primary-air damper, according to the proportion of carbonic oxide in the exit gases, as judged by the eye, suffices to keep the combustion almost within the theoretical limits. The proportion of carbonic acid in the escaping gases remains between 18 and 19 per cent., and the temperature between 500° and 550° C. (930° to 1020° Fahr.).

Special care must be taken in clinkering, and the draught and air supply carefully looked after at the time, as the setting is of light construction and stores up comparatively little heat. A troublesome construction of the grate has been remedied by introducing a step-grate. Owing to the small height between the grate and the gas-exit passages, there is only a comparatively small depth of incandescent coke in the producer, especially after clinkering, and as a result 1½ to 2 hours elapse before normal combustion is restored and the setting regains its proper temperature. The maintenance of a uniformly high temperature and uniform distribution of the heat in the different passages of the setting are absolutely essential for the proper working of the setting and for its durability. The lower passages should be inspected at least once a day, to see that they are not blocked by blown ash or clinker, and frequent measurements of the temperature should be made with a pyrometer, of which the Wanner type is ideal for this purpose. Various other cleaning operations are necessary once every two to four months. Owing to the shallowness of the regenerative flues and their ready accessibility, any caulking of them that may be required is easily carried out. The horizontal take-off pipes have to be cleared once in four days, and the pans in the hydraulic main cleared of thick tar. The original arrangement of the take-off pipes rendered the clearing of them a difficult matter, and required the services of three men; but in reconstructing, this difficulty is being avoided. Sprinkling the ascension pipe has diminished the formation of thick tar or pitch; but ammoniacal liquor has not proved satisfactory for the purpose, because it corrodes the numerous cocks.

The retorts are scurfed once in 30 to 35 days, by burning them out completely, for which 14 to 18 hours are necessary. The recovery of the scurf is thereby foregone; but, on the other hand, injury to the retorts by scurfing tools is avoided. The regular burning-off of the scurf has considerable influence on the discharging of the retorts, because when the layer of scurf has become too thick pieces of it fly off when steam is admitted, and the resulting holes serve to cause the cake of coke to hang up in the retort. For the first two days after scurfing, no steam is admitted to the retort; so that the rough surface becomes covered with a thin layer of scurf, which facilitates the discharge of the coke. According to experience at Cologne, it is an advantage in regard to the discharging of the coke to mix unscreened coal with nuts. The coal then cakes better, probably owing to the rather higher proportion of water in the washed nuts, and the coke is denser and sticks less firmly to the walls of the retort.

In regard to the industrial results obtained with the vertical retort-settings, and the advantages of the system compared with the former working, the works' figures for the past years afford the best answer. The year 1907-8 is ignored, because vertical, inclined, and horizontal retorts were in use at the same time, and the results cannot be properly separated; while the regulation of the vertical-retort settings had not then been perfected and the transition from 11 to 12 hours carbonizing time had not been made. The figures for the make and quality of the gas and the quantity and composition of the bye-products given are average values for the last three working years. The working has been with steaming during the last two of the twelve hours occupied in working-off the charge; the steam being at half-an-atmosphere pressure. For comparison, the average results are given for the working of horizontal-retort settings in the years 1900 to 1907; and as repeated investigations extending over a number of years showed that the carbonizing results were the same for inclined retorts, the figures may be taken as applying also to the latter system.

The trial runs for the purpose of testing coal, which were made in one of the settings of vertical retorts without the admission of steam, show interesting results. About 30 tons of coal were carbonized in each trial. The temperature at which the setting was worked was higher in the last of the three years—viz., about 1240° to 1280° C. (2264° to 2336° Fahr.). This, since steam was not being admitted, was purposely lower than the temperature maintained in the other settings—viz., 1300° to 1315° C. (2372° to 2399° Fahr.). The results of the coal-testing trials in the experimental vertical-retort setting are shown in Table I.

Table I.—*Coal Testing Trials. Average Results.*

Retorts	Inclined.	Vertical, without Steaming.		
Year	1908-9.	1908-9.	1909-10.	1910-11.
Number of trials	16	14	30	31
Make of gas per ton of coal; cubic feet at 60° Fahr. and 30 in.	10,846	11,383	11,474	11,770
Calorific power, B.Th.U. per cubic foot at 60° Fahr. and 30 in.	570	568	572	575
Valuation figure (make multiplied by calorific power)	6,181,829	6,467,891	6,566,756	6,773,169

These results, speaking generally, are no higher than those obtained earlier from horizontal retorts when the latter were charged, as had been found advantageous, with uniformly mixed large and small coal from different pits. The make of gas, however, showed a considerable increase in an experiment in which coal of different origin and of different size was mixed, as had been done in large-scale working. Trials made with such mixed coal showed, without steaming, an average make of 12,200 cubic feet per ton. The inclined retort tests of coal made in 1908-9 [Table I.] likewise were on about 30 tons of coal, and the values agree closely with the trial figures obtained from horizontal settings, which, for the year 1904-5 showed a make of 11,002 cubic feet per ton. In the last two years, the tests of coal have been made only in the vertical retort-setting. The noteworthy feature of the results of the different years is the rise in calorific power and in the valuation figure which accompanies the increase in the make of gas. This is a striking characteristic of vertical-retort working, and is contrary to earlier experiences in carbonization. For instance, the figures given in Table II. show the results of the working of horizontal retorts in the years 1902-3 and 1904-5.

Table II.—*Results of Horizontal-Retort Working.*

Year	1902-3.	1904-5.
Make of gas per ton of coal, cubic feet at 60° Fahr. and 30 in.	10,668	11,343
Calorific power, B.Th.U. per cubic foot at 60° Fahr. and 30 in.	593	559
Valuation figure (make multiplied by calorific power)	6,331,223	6,340,709

In the latter year, the heats of carbonization were considerably higher than in the former; but it will be seen that the valuation figure is practically identical—the increased make of gas being attended by a falling off in the calorific power. The rise in the valuation figure with increase in the heats of carbonization, which the trials with the vertical retort-settings show, is also clearly displayed in the results of working on the large scale; but in the latter, the better utilization of the steam introduced when

Table III.—*Working Results with Vertical Retorts with Steaming.*

Year	1908-9.	1909-10.	1910-11.
Make of gas per ton of coal, cubic feet at 60° Fahr. and 30 in.	12,703	13,399	14,203
Calorific power, B.Th.U. per cubic foot at 60° Fahr. and 30 in.	544	538	526
Valuation figure (make multiplied by calorific power)	6,910,689	7,209,465	7,464,875

the temperature of the setting is increased has also to be taken into account.

The results of the vertical-retort working with steaming in the last three years are shown in Table III.

Frequent analyses of the gas obtained with the make of 14,203 cubic feet per ton showed that it had the following average composition:—

	Per Cent.
Carbonic acid	1·9
Heavy hydrocarbons	2·4
Carbonic oxide	13·4
Methane	22·1
Hydrogen	56·9
Nitrogen	3·3
	100·0

It might be argued that the favourable results obtained with the vertical retorts have been due to the coal having improved in quality in recent years. The results of the analyses made of the coal in the last three years and in the year 1902-3 are given in Table IV., and show such close agreement that the results of the make obtained in the different years may be taken as comparable values.

TABLE IV.—*Average Composition of Coal Carbonized.*

Year	1902-3.	1908-9.	1909-10.	1910-11.
No. of Analyses	128	132	73	118
Moisture, per cent.	3·05	2·50	2·37	2·36
Volatile matter, per cent.	..	28·49	28·86	28·82
Coke, per cent.	..	69·01	68·77	68·82
Ash, per cent.	11·07	10·73	10·63	11·58
Calorific power, B.Th.U. per lb.	12,571	..	..	12,533

The question whether the introduction of the vertical retort constitutes a great advance in gas manufacture must therefore, on the strength of these working results extending over a number of years, obviously be answered in the affirmative. It is interesting, however, to inquire how the improved values are obtained, and in what respect the conditions of carbonization in vertical retorts differ from those of the older systems. In the author's opinion, the vertical retort combines in a happy consummation two factors. (1) The complete filling of the whole retort space up to a certain height—*i.e.*, about 27½ inches from the upper edge of the retort mouthpiece—and the closer packing of the coal, whereby the highly-heated, uncovered retort walls are reduced as far as possible, and a greater velocity of the stream of gas ensues; and (2) the temperature selected and the possibility of increasing it up to the limit of durability of the fire-brick material, and its gradual diminution from the bottom to the top of the retort. The rise in the valuation figure with the increase of temperature is directly dependent on the far greater protection afforded to the produced gas. Gasification takes place more quickly when the heats are higher, while with the vertical retort the gas passes to the ascension pipe chiefly through the cold mass of coal, and only to a small extent past the hot walls of the retort; and as the evolution of gas is greater, its velocity increases and a greater proportion is protected from decomposition. On the other hand, with horizontal and inclined retorts the gas must pass through the comparatively large free space above the coal, in which it is exposed throughout to the high temperature of the setting. Gasification accelerated by increase in the temperature will in these unfavourable conditions be less capable of realizing the advantages which are associated with the greater production of gas.

The assumption that the gasification process takes place in the vertical retort in altered conditions is clearly supported by the quantities and the composition of the bye-products obtained. The variations in the ammonia, tar, sulphur, cyanogen, and naphthalene produced can only be explained by assuming that the method of working in the vertical retort is fundamentally different. The amount of tar produced in the vertical retort-settings was on the average 4·99 per cent. by weight of the coal carbonized the last three years, as compared with 4·44 per cent. in the years 1901-2 to 1906-7 when other types of retort were in use. The tar products from the various types of setting are also quite different. The tar from the vertical retorts is a thinly fluid, oily product, whereas that from horizontal and inclined retorts is a thick and viscous material. Table V. shows the difference in the properties of the two tars.

TABLE V.—*Properties of Coal Tar.*

From	Vertical Retorts.	Horizontal Retorts.
Specific gravity	1·112	1·120
Proportion of pitch, per cent.	25-30	55-60
Free carbon, per cent.	1·5-2·5	20-25
Naphthalene	None separated on distillation	Large quantities separated in solid state

The yield of ammonia, computed from the amount of ammoniacal products sold, was, on the average of the last three years with vertical retorts, 0·322 per cent. of real ammonia on the weight of coal carbonized, or equivalent to 28 lbs. of sulphate per ton of coal; whereas in the years 1901 to 1907 the proportion of real ammonia was 0·232 per cent. of the weight of coal carbonized, which is equivalent to 20⅛ lbs. of sulphate per ton.

The coke produced under the higher pressure prevailing in the vertical retort is denser than that produced in inclined and horizontal retorts, and more nearly resembles oven-coke. It is in large pieces, and the weight of a given volume is greater. The ratio of the weight of a given volume of inclined-retort coke to vertical-retort coke is 1 : 1·16.

Attempts to ascertain the amount of coke consumed in water-gas production led to no conclusive result; but it is clear that the scurf largely contributes to the decomposition of the steam, because in the lower half of the retort it is of a porous honeycombed structure, as opposed to the close structure of that in the upper part. It may be pointed out that the water gas produced in vertical retorts differs considerably in calorific power and composition from that made in separate generators. It is carburetted to a certain extent with methane and heavy hydrocarbons, either in the retort or on its way to the hydraulic main. This should be taken into consideration in any comparison of the economy of the two methods of producing water gas. Table VI. shows the difference in the composition of the two gases.

TABLE VI.—*Quality and Composition of Water Gas.*

From	Vertical Retorts.	A Generator.
Calorific power, B.Th.U. per cubic foot at 60° Fahr. and 30 in.	330	288
Carbonic acid . . Volumes per cent.	1·6	2·2
Heavy hydrocarbons ,, ,,	0·8	..
Oxygen ,, ,,	..	0·4
Carbonic oxide ,, ,,	40·0	42·4
Methane ,, ,,	1·2	0·3
Hydrogen ,, ,,	53·3	50·6
Nitrogen ,, ,,	3·1	4·1
	100·0	100·0

The introduction of the vertical retort has been attended with certain indirect advantages of considerable importance. The proportion of naphthalene in the gas is so small that naphthalene washers are no longer necessary. The amount in the purified gas is so little that it cannot be estimated exactly. When vertical retorts were first brought into use, however, the naphthalene already clinging to the walls of the distributing mains was taken up by the gas poorer in naphthalene and carried forward, and it was either recovered in the syphons or it blocked the service-pipe. The proportions of cyanogen and sulphur in the crude and purified gas are shown in Table VII.

TABLE VII.—*Cyanogen and Sulphur in the Gas.*

Gas	Crude.		Purified.	
Retort	Vertical.	Inclined.	Vertical.	Inclined.
Cyanogen, grains per 100 cubic feet	46·3	101·4	8·74	19·67
Sulphur, ,, ,,	323·4	458·9	13·98	20·98

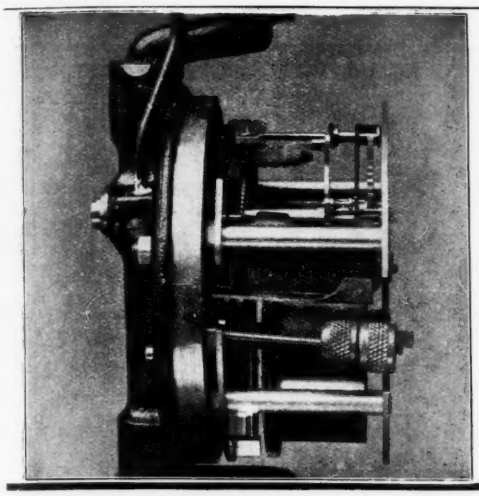
It has not been possible to establish the relief afforded to the purifiers on the large scale by the reduction in the proportions of cyanogen and sulphur in the gas, because a new purifying system was brought into action at the same time as the vertical retorts, and later, artificial purifying material was substituted for oxide. Exhaustive experiments in the experimental plant, however, show that the artificial oxide purifies about double as much vertical-retort gas as inclined-retort gas. These figures are in substantial agreement with the analytical results given in Table VII.

Naturally, it has not hitherto been possible to give an exact answer to the question of the durability and the cost of repairs of vertical retort installations. Previously, the only answer that could be given was that in this respect they appeared to be quite fulfilling the best anticipations. It has now been established, however, that during the period of four years working there has not been a single case where it has been necessary to repair the retorts or the settings themselves. Current maintenance charges included only the natural replacement of mechanical parts, the renewal of the lower doors which burned through after a time, and partial renewal of the upper lids. The latter, as first made, were too weak, and have been strengthened by ribs and an alteration of the eccentric framing. The consumption of the lower doors averages 10 per cent., and of the upper lids 12 per cent. per annum. The different benches of settings have remained in work for the number of days stated below before it has become necessary to renew, partially or entirely, the retort-chamber.

Bench No. I.	1501	setting-days
,, No. II.	963	,, ,,
,, No. III.	1115	,, ,,
,, No. IV.	1345	,, ,,

The average working life has, therefore, been 1231 days.

The great differences shown for the various benches are due to the desire to avoid repairing the whole of the settings at the same time, and to distribute the work of repair. Consequently, the lower halves of the retorts in Benches II. and III. were replaced before absolutely necessary; while Bench No. IV. was reconstructed in May and June last, and the renewal of Bench No. I.



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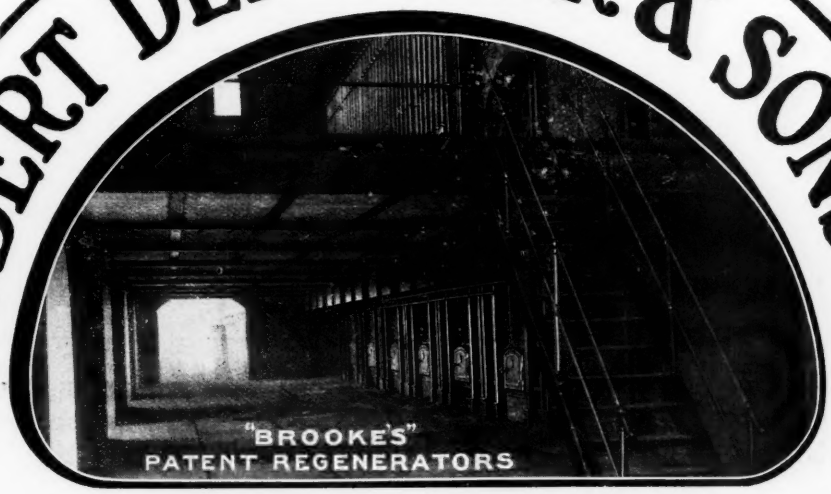

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will be put in hand this autumn. The average make of gas per setting has been 166,304,300 cubic feet, compared with 123,606,000 cubic feet for horizontal-retort settings. The cost of the repairs for the 24 vertical-retort settings has been £3500. This includes the cost for Bench No. I., which is to be carried out this autumn, and for which the expenditure on Bench No. IV. gives the necessary figures. The cost of repairs or renewals has, therefore, been found to amount, for vertical retort-settings, to 0·23d., and for horizontal retort-settings to 0·4d., per 1000 cubic feet of gas made. It has not yet been possible to ascertain exact figures for the inclined retort-settings, as they have been so little used that renewal will only become necessary in the course of the present year.

The lower cost of repairs of the vertical retort-settings is chiefly to be ascribed to the much greater make of gas and the lighter construction of the settings. On taking down the settings, however, they were found to be throughout in such good condition that, with the exception of the retorts and the stiffening slabs in the lower parts, almost all the material could be used again in the reconstruction. There were only trifling settlings of the side walls of the settings, and the burner-nozzles had not been affected by the fire. The producers were relined in the furnace zone, and the slabs above the clinkering doors were also renewed in order to ensure smooth working.

In conclusion, the author points out that the comparative values given in his paper admit of deductions being drawn as to the working and economical advantages of the vertical-retort system over the older systems of carbonization. The greater make of gas, the increase in the valuation figure with the rise of temperature, and the quantity and composition of the bye-products obtained, show that carbonization takes place under greatly altered conditions, which open out a hopeful prospect for the further development of the vertical retort-setting. The settings of eighteen vertical retorts which are now being introduced, with still better working results, already show further progress.

COKING INDUSTRY OF SOUTH YORKSHIRE AND DERBYSHIRE.

In the "JOURNAL" for the 11th of April last (p. 109), an abstract was given of a paper read by Professor L. T. O'SHEA, of the Sheffield University, on the subject of "Recent Progress in the Bye-Product Coking Industry." The author has an interesting communication in the current number of the "Journal of the Society of Chemical Industry" on the position of the industry in South Yorkshire and Derbyshire; and we make the following extracts from it.

The manufacture of coke has been an extensive industry in South Yorkshire for many years, owing to the fact that most of the seams north of the Don yield coking coals. Before the year 1899, the coals were coked chiefly in beehive ovens, and, except in a few isolated instances, the recovery of bye-products from coke-ovens was not attempted. A noticeable instance of this exception is the successful recovery of bye-products from coal coked in the beehive oven by Messrs. Newton, Chambers, and Co., at the Thorncliffe Coal and Iron Works. This firm have for many years recovered ammonium sulphate, and illuminating and lubricating oils, from coal coked in their patent beehive oven, and are well known for the manufacture of the disinfectant "Izal" from the products of the distillation of the tar oils. The manufacture of coke in the modern retort or closed oven with bye-product recovery in South Yorkshire practically dates from 1900, when the first battery of 35 ovens was started at the Wharncliffe Silkstone Collieries by Messrs. Simon-Carvès. Since that year considerable progress has been made in South Yorkshire and North Derbyshire. The development of the industry is interesting, not only from the point of view of its rapid growth, but also as affording an example of the improvements and modifications in oven construction which have closely followed one another as manufacturers and oven constructors gained experience of the conditions necessary for successfully working the plant.

The following figures, taken from the Mines and Quarries General Report, Part III., "Output" for 1909, show the extent of the industry in Yorkshire and Derbyshire. The quantity of

—	Yorkshire.		Derbyshire.	
	No. of Batteries.	No. of Ovens.	No. of Batteries.	No. of Ovens.
Simon-Carvès	20 (a)	729 (a)	0	0
Simplex	1	44	2	150
Semet-Solvay	3	92	0	0
Koppers	8 (b)	317 (b)	0	0
Huessener	1	30	2	100
Mackey-Seymour	1	32	0	0
Otto-Hilgenstock	5 (c)	325 (c)	1	60
Coppée	0	0	2 (d)	117 (d)

(a) Including 4 under construction, consisting of 94 ovens.
(b) " 2 " " " 65 "
(c) " 2 " " " 100 "
(d) " 1 " " " 50 "

coke manufactured at coke-ovens in the United Kingdom was 10,240,093 tons; in Yorkshire, 2,684,102 tons; and in Derbyshire, 234,825 tons. With the exception of Durham, in which county 5,335,790 tons of coke were produced in 1909, Yorkshire is the largest coke-producing county in the United Kingdom.

The following figures, supplied by the various firms of oven constructors, show the extent of the bye-product recovery industry in the counties named.

The number and kind of oven, whether bye-product or not, in use in 1909, are shown by the following figures, taken from the report above mentioned:—

Kind of Oven.	Yorkshire.	Derbyshire.
Beehive	3802	302
Simon-Carvès	709	0
Semet-Solvay	125	0
Coppée	50	67
Koppers	72	36
Otto-Hilgenstock	325	60
Simplex	44	150
Huessener	25	34
Collins	45	0
Mackey-Seymour	32	0
Other kinds	74	0
Total	5303	649

COKING COALS.

South Yorkshire Coalfields.—Most of the coal seams north of the Don are coking coals, and among the seams which are used in South Yorkshire for coking, either alone or mixed with coal from other seams, are the Tinsley Thin, High Hazels or Kents Thick, Barnsley Bed, Swallow Wood, Fenton, Parkgate, Thorncliffe Thin, Silkstone, Whinmoor, and Soft Bed or Coking Coal. Among the Yorkshire coals, the most important, and perhaps the most generally used, for coking are those from the Barnsley, Parkgate, and Silkstone seams.

Derbyshire Coalfields.—This coalfield is co-extensive with the South Yorkshire coalfield, and in its northern area furnishes many excellent coking coals, though south of Ilkeston the coals appear to lose their coking properties. Among the coking coals of North Derbyshire are those from the following seams: High Hazels, Top Hards, Waterloo, Deep Softs, Deep Hards, Piper, Tupton, Three-quarter, and Black Shale.

Correlation of the Seams.—It is generally accepted that the following seams in the two counties correspond with one another. Barnsley Bed and Top Hards, Parkgate and Deep Hards, Silkstone and Black Shale; but the correlation of the other seams presents some difficulties. Approximate analyses of some of the Yorkshire and Derbyshire coals are given in the following table:—

—	Volatile Matter.	Fixed Carbon.	Ash.	Moisture.	Sulphur.
Yorkshire.					
High Hazels	35·32	63·11	1·57	..	2·49
Barnsley	30·97	64·65	4·38	..	1·94
Swallow Wood	30·44	63·69	5·86	..	2·64
Parkgate	30·56	65·59	3·84	..	2·18
Thorncliffe Thin	35·52	63·98	0·50	..	..
Silkstone	32·29	65·08	2·36	..	..
Whinmoor	32·95	60·83	4·60	1·62	..
Derbyshire.					
Waterloo	34·17	53·38	3·89	7·94	..
Deep Softs	35·27	55·50	3·55	5·68	..
Deep Hards	33·48	56·95	5·18	4·39	..
Piper	34·78	55·35	5·94	3·93	..
Tupton	34·17	58·89	3·38	3·56	..
Black Shale	36·12	55·11	6·29	2·48	..

It will be seen from the analyses that the proportion of volatile matter obtained from the Yorkshire and Derbyshire coals is very high. The substances recovered from them are ammonium sulphate, tar, benzol, and gases. The yield of products generally obtained is: Ammonium sulphate, 22 to 35 lbs. per ton of coal; tar, about 5 per cent.; 65 per cent. benzol, from 2·25 to 2·5 gallons per ton; and gases, 10,000 to 11,500 cubic feet per ton.

THE COKING SLACK.

The coal generally used is the small coal or slack that is separated from the larger coal in the process of screening which the coal undergoes directly it is drawn from the pit. In cases, however, where the quantity of slack made is insufficient, some of the larger coal is crushed and sent to the coke-ovens. Sometimes dry slack is used for coking purposes. Washing the slack is generally resorted to where it is required for use in bye-product ovens. This, by removing the mechanically mixed dirt, greatly improves the quality of the coke, and reduces the quantity of ash and sulphur in it.

COKING IN BEEHIVE OVENS.

The manufacture of coke in beehive ovens is more extensively practised in South Yorkshire than in Derbyshire. In the former county, 3802 beehive ovens were in use in 1909; in the latter there were 302. The ovens are dome-shaped chambers, about 13 feet in diameter and from 7 to 8 feet high in the centre. They are built in batteries in two rows, back to back, with a common flue running the whole length of the battery. In front of each oven is a doorway, which, during the coking process, is closed with bricks well covered with "daub," while in the crown of the dome is an opening or hopper used for charging purposes. Each oven

is connected with the central flue by means of a port through which the waste gases pass into the flue, and from it are conducted under boilers, where they are used for generating steam. The ovens are charged with a layer of slack (usually washed) 2 ft. 3 in. to 2 ft. 6 in. thick, and air is admitted through a small opening left in the bricked-up doorway. The heat retained in the masonry soon causes the coal to distil, and the gases take fire in the dome of the oven. When the gases are well alight, the hoppers at the top of the ovens are closed with dampers, and the coking of the coal proceeds slowly from the top downwards. The coking time varies from 72 to 96 hours; and when complete the coke is quenched inside the oven by breaking-down the upper part of the doors, and discharging copious quantities of water on the red-hot mass. After quenching, the coke is raked out by hand or else by means of mechanical rakers, on to platforms in front of the batteries. The chief qualities of coke produced are blast-furnace, steel-smelting, and foundry.

Bye-Product Ovens.

Retort-ovens without recovery of bye-products were in use in Yorkshire more than thirty years ago; but for various reasons the process fell into disuse until the year 1899. During this period, the only successful plant was the beehive open recovery plant of Messrs. Newton, Chambers, and Co.

In 1899, the construction of the first retort-oven bye-product plant in this district was commenced at the Wharncliffe Silkstone Collieries, and in 1900 a battery of 35 Simon-Carvès ovens with recovery plant was started. This may be looked upon as the pioneer plant; and in comparison with the more modern plants it serves as an illustration of the great advances that have been made in oven construction.

In the early days of oven construction, the horizontal flued ovens were generally preferred. The tendency of recent years has been to adopt vertical flued ovens, though there are certain well-known instances of horizontal flued ovens. Examples of the vertical flued ovens in the Yorkshire district are the Simon-Carvès, Koppers, Otto-Hilgenstock, and Coppée; while the Semet-Solvay and Huessener are horizontal flued ovens.

One of the most striking improvements in oven construction is the distribution of the air supply as well as the supply of gas to each combustion flue. The first ovens on this principle to be erected in this district were the Koppers ovens; other examples are the Simon-Carvès (Poetter patent). The dimensions of the ovens are generally: Length, 30 feet; height, 6 to 8 feet; width, 15 to 22 inches. Both ends of the oven chamber are open, and are closed with doors during the coking process. The ovens are built in batteries of from 35 to 50 ovens in a battery.

The slack is charged into the red-hot oven by hand through charging-holes in the crown of the oven, or mechanically, after compression into the form of a cake, through the doors. The doors and charging holes are closed, and well luted with puddled clay. The decomposition of the coal begins at once, and the coking proceeds slowly from the sides of the oven towards the centre. The volatile products are removed from the ovens by means of exhausters through stand-pipes in the roof, which connect with mains that convey the products to the bye-product recovery plant. The exhausters are usually placed between the coolers and the ammonia scrubbers. The coking time varies from 36 to 45 hours. When the charge is completely coked, the oven is drawn by opening the doors and pushing the coke out on to a platform, where it is quenched by discharging on to the red-hot mass copious volumes of water. This may be carried out by hand, or by mechanical quenchers. As soon as the oven is discharged, the doors are closed, and the oven is again filled with a fresh charge of slack.

Recovery of Bye-Products.

The Old Process.—The old process for the recovery of bye-products consists in: (1) Cooling the gases for condensation of tar and ammoniacal liquor. (2) Water washing to recover ammonia from the cooled gases. (3) Creosote washing for benzol recovery. The general arrangement of the plants is based upon those used in gas-works, and presents no novel features. No steps are taken to purify the gases after the removal of the bye-products, unless the gases are to be used in gas-engines, when usually filtration, and occasionally oxide of iron purification, are resorted to.

The tar is separated from the condensed ammoniacal liquor, and sold without further treatment. The composition of the tar produced in retort-ovens resembles that made in gas-retorts. It is rich in naphthalene, carbolic acid, and anthracene, and its specific gravity varies from 1·1 to 1·2. The ammoniacal liquor is distilled in continuous stills of the Coffey type, with steam and lime, and the gases passed into sulphuric acid in the usual way. The benzol is recovered from the creosote oil by distillation; and the process may be intermittent or continuous.

The treatment and disposal of the effluent from the ammonia stills is a most important question in bye-product plants in Yorkshire, owing to the restrictions imposed by the various Rivers Boards on the discharge of effluent from the stills into streams, and several methods are used for its disposal, of which the following are the most generally adopted: (1) The liquor flows into settling-tanks, and the clear, but dark-coloured, liquor flows away into the stream. (2) Where disused workings are available, it is allowed to flow into them without preliminary treatment. (3) It is pumped on to spoil-heaps that are on fire, and there gradually evaporates. (4) After passing through settling-tanks, it is used to quench the coke. (5) It is evaporated by spraying the liquor into a furnace heated with solid fuel or waste gases from the coke-ovens.

Direct Sulphate of Ammonia Process.

The problem of doing away with the effluent from ammonia stills, or at least confining the quantity to the smallest limit, would appear, in some measure, to have found a solution in the recovery of sulphate directly from the gases. The process originated with Herr F. Brunck, of Dortmund, who passed the gases coming from the coke-ovens at a temperature of 70° C. into saturators containing sulphuric acid. The process failed through the imperfect condensation of tar. It has, however, since been perfected, and direct-recovery processes are now recommended by the various oven-construction firms. Those now adopted are all based on Brunck's original plan—viz., to pass the gases into the saturator at a temperature above their dew-point (60° to 70° C.), and so avoid the condensation of the moisture they contain.

The processes may be divided into two classes: (1) The gases are cooled to 15° C. to condense the tar, and subsequently heated to 70° C., after which they pass through the saturator maintained at about 100° C. The initial cooling causes the condensation of ammoniacal liquor, which is distilled with lime, and the ammonia liberated passes into the saturator. The effluent from the still is reduced at least 50 per cent. by this process. Koppers was the first to introduce this method successfully; and there are at least two other plants designed to work on similar lines. In Yorkshire, one Koppers direct-recovery plant is in work at the Corton Wood Collieries. (2) In the second class, the gases do not undergo any special cooling beyond that which takes place in the mains conveying them to the bye-product plant. To this class belong the Otto process, in which the tar is removed by a tar spray, and the Simon-Carvès process, in which the tar is mechanically removed. After removal of the tar, the gases, at 70° C., charged with the moisture that they originally contain, pass through the saturator, the temperature of which is about 100° C.

For these processes it is claimed that no effluent, or at least only a very small quantity, is produced, and that quite harmless. In these processes benzol cannot be recovered unless the gases are cooled after passing through the saturator. If the benzol is recovered, an effluent is produced; but it is claimed that the effluent that separates is innocuous, as it is free from the cyanides, thiocyanates, and tar compounds.

Feld and Burkheiser Processes.

The latest advance in ammonium sulphate production is to use the sulphur in the gases for the production of sulphate. There are two such processes—the Feld and the Burkheiser. In the Feld process, the sulphuretted hydrogen is fixed as ferrous sulphide, which, by treatment with sulphur dioxide, is converted into ferrous thiosulphate. This is converted into ammonium thiosulphate, which is subsequently oxidized to sulphate. In the Burkheiser process, the sulphur compounds are removed by oxide of iron purifiers, and subsequently converted into sulphur dioxide by oxidation. The sulphur dioxide is combined with the ammonia, and Burkheiser salt—a mixture of ammonium sulphate and sulphite—is produced.

The Resulting Gases.

The gases that come from the bye-product plant are primarily used for oven-heating. With the Yorkshire and Derbyshire coals, from 30 to 50 per cent. of the gas produced is required for this purpose. The remainder is surplus gas. In most of the plants this surplus is used for raising steam; but at a few collieries it is employed for generating power in internal combustion motors. The amount of gas available for this purpose is from 5000 to 7000 cubic feet per ton of coal carbonized. The composition of the gas is similar to that of illuminating gas, and its calorific power varies from 450 to 600 B.Th.U. per cubic foot, according to the quantity of nitrogen it contains.

At the Wharncliffe Silkstone Collieries, considerable developments have taken place in the use of gas for power generation. The plant consists of engines entirely run on the gas from a battery of Simon-Carvès ovens. At the Thorncliffe Iron-Works and Collieries, engines amounting to 500 H.P. are driven with gases from a battery of Kopper's ovens; and at Mitchells' Main, gases from a battery of Simon-Carvès ovens are used to generate 500 H.P. in 250 sets.

ELECTRIC POWER IN GAS-WORKS.

The current issue of the "Engineering Review" contains an article on this subject by Mr. J. A. Seager, B.Sc., Assoc.M.Inst. C.E., much of which (so far as the description of plant is concerned) is familiar reading to gas-works engineers. The introduction to the article gives the personal views of the author.

Mr. Seager writes: Viewed in the light of present-day experience, it is unfortunate that the starting point of both gas and electric light undertakings was the provision of illumination for the general public. If the motor and the gas-engine had attained widespread use before the carbon lamp and the gas-jet, there is every probability that the essential antagonism of gas and electricity supply would not have been taken for granted by their respective engineers. The question as to whether an electricity supply should be run by town's gas-engines, or the mechanical

operations of a retort-house and yard should be carried out by electric power, would probably have been settled purely on financial and technical grounds; the engineering pros and cons being weighed up without reference to sentiment or animus. As it is, a mutual interchange of power appears to be unthinkable. At one end of the scale, however, we already see the large power gas-engine an accomplished fact for alternator driving; and it is probable that within a very short period the gas-turbine will challenge the steam-driven rotary-engine. We have, on the North-East Coast, one example of the way in which electric lighting has become an altogether secondary problem to the large power-in-bulk supply of electricity. Viewed from the gas engineer's standpoint, the lighting problem of the middle-class population is solved by him; but he has to face either an expensive system of high-pressure gas transmission, involving costly compressing plant, and the possibility of a large percentage leakage, or be content with a short radius distribution, while the electric supply uses three-phase high voltage and goes far afield. The introduction of the mantle in place of the jet has made a heating gas more generally desirable than an illuminating gas; and therefore town gas could approximate much more closely to power gas than was the case in the past. Moreover, the sulphur restrictions are not now so necessary; and town gas will probably develop into as cheaply made a commodity as producer gas. It would, therefore, seem as if, in the future, gas and electric engineers could abandon their differences, and operate conjointly. Possibly the day will come when gas will be made chiefly to feed electric generators and local town lighting and such cases of steady power as can be easily reached by a comparatively compact group of gas-mains, while the electric section will transmit power to the outer circumferences of the area served with minimum losses, for power and traction purposes, together with a supply to such lighting consumers as prefer electricity to gas.

This, of course, is a very big subject which has many conjectural points; but it is necessary to outline the general prospect in order that the next statement may not be misunderstood. In view of the very large extent to which electric power has been adopted in all classes of industries, it is an extraordinary feature (leaving out of count the hampering condition that the introduction of electric power to a gas-works might under the present conditions of antagonism be regarded as giving the wrong kind of advertisement to gas power) that electric power has not been more largely used in gas-works. In no other industry requiring so much power scattered over appreciable distances, and in some cases involving awkward systems of transmission except by electricity, has so little electric power been used; and it is the object of this article to show that such use is technically and commercially possible by describing actual instances of the installation of electric power in gas-works in operation at the present time.

The possible uses of electric power in gas-works may be briefly summarized as follows. On arrival of the coal at the wharf or siding it has to be transferred from the barge or truck to a store, from which it is fed to the retort-house as required. Here it is charged into retorts by machines adapted to the purpose, and after distillation is complete the coke is drawn mechanically. This coke has to be conveyed away to a store, and has to be broken into convenient sizes by coke-breakers. The gas has to be propelled by exhausters or blowers, while the residual liquids have to be pumped to the departments dealing with them. In the application of electric driving for plants erected in gas-works, it is the usual custom, at present, to lay down duplicate generating plant driven by gas-engines, and in consequence independent of any external municipal power station supply, in order to ensure that in the event of the failure of the latter, the gas manufacturer would not be affected.

The degree to which electric power can be advantageously used in gas-works depends to a large extent on their size, as the mechanical operations in a small works are carried out as far as possible by hand, and where power is necessary, steam or compressed air is found suitable over comparatively small radii from the engine-house. Where the question of coal and coke handling becomes an important one, however, electric transmission is found useful from the point of view of convenience in application. The question of efficiency as compared with the gas or steam engine does not enter very largely into the matter, as the mechanical efficiency of the handling plants themselves is so low. [This was shown by a table extracted from a paper by Mr. R. E. Gibson, given before the Liverpool Engineering Society on the "Transport of Materials in Gas-Works."*] The highest of these, excluding the tip waggon and railway, is 39·03 per cent.; and therefore it is no use debating whether for coal and coke handling gas or electric drive is going to give an extra ½ per cent. efficiency—the question is that of convenience.

This point of view is borne out in a letter sent to the writer of the article by West's Gas Improvement Company.

> We often find it convenient to apply electric power for the purpose of driving our coal and coke handling plants, owing to the fact that the driving gear is chiefly applied at elevated positions and at a long distance from the main source of power supply. We have also applied electric power to our stoking machines; but we are not prepared to state in this case that it has any advantage over compressed air for this particular purpose—each system having some advantages over the other.

Mr. Seager then proceeds to describe the application of electrical plant to coal loading and conveying plant and to retort charging—reserving other applications for a subsequent article.

* See "JOURNAL" for Jan. 17 last, p. 163.

JUNIOR INSTITUTION OF ENGINEERS.

Summer Meeting in East Anglia.

Unlike their Seniors, the members of the Junior Institution of Engineers do not read and discuss papers during the summer meetings; the time being solely devoted to the visiting of engineering and other places of interest, alternating with what perhaps might be termed days of "pure" pleasure.

The Council were wise in their choice of venue this year; for East Anglia was found to afford ample material for both divisions of the programme. The district was probably chosen with reference to the workplace of the Institution's distinguished President, Sir J. J. Thomson, F.R.S., who is Professor of Physics in the University of Cambridge. It was really delightful to notice how this great physicist fraternized with all the members—strolling along with them and discussing science in quite a free and easy fashion. Lady Thomson, too, was extremely kind and gracious. Unfortunately, the death of her cousin, the Bishop of Oxford, prevented her from being present at the summer dinner; but the members had the honour of a greeting from her at the "At Home" which was given as the concluding item of the programme "to meet the members of the Junior Institution of Engineers."

The majority of the members attending hailed from the Metropolis; but the Provinces were also well represented—particularly, of course, the eastern counties district. Those present included Mr. H. G. Kettle, of Ipswich, Mr. E. P. Hudson, of Norwich, and Mr. Julian Julian, the Borough Engineer and Surveyor of Cambridge; from Sheffield, there was Mr. J. R. Williams, the Superintendent of the Corporation Tramways Department; from Dublin, Dr. W. E. Lilly, Professor of Mechanical Engineering at Trinity College, and the Institution's Member of Council for Irish districts; and from Swansea, Mr. H. E. Hyne. Of the Council, the attendance list contained the names of the Chairman, Mr. B. E. Dunbar Kilburn, M.A. (Cantab); the Vice-Chairman, Mr. S. Bylander; Mr. Sydney V. Cooke (Hon. Librarian); Mr. G. T. Bullock (Past-Chairman); Mr. Reginald Krall, Assoc.M.Inst.C.E., Mr. J. H. Pearson, M.S.A., and Mr. H. P. Philpot, Wh.Sc., Members of Council; and the Secretary and Treasurer, Mr. Walter T. Dunn, F.C.I.S.

For the convenience of the London contingent, carriages were reserved in the ten a.m. non-stop train from Liverpool Street to Felixstowe on Saturday, July 29—a most enjoyable week-end being spent there, with headquarters at the Felix Hotel.

Visit to Ipswich Engineering Works.

The technical portion of the programme opened on the following Monday morning; the party proceeding by Great Eastern Railway Company's steamer to Ipswich. On arriving, they were met by the Directors of Messrs. Ransomes and Rapier, Limited, and conducted round their works in groups, so that the explanations of the various processes could be heard by every member. The wood-working department consists of two bays—one occupied by the pattern shop and the other by the carpenters' shop. They are well equipped with modern tools of all descriptions. The power-house attracted much attention. It contains three direct-coupled 250-volt steam-driven generating sets; two having an output of 100 k.w. each, and the other is a 200 k.w. set. There are two air compressors, delivering air at a pressure of 100 lbs. per square inch, and a testing set of variable voltage and current for testing electric cranes. Three boilers, fitted with an economizer, supply steam at 150 lbs. pressure per square inch.

The turnery, occupying three bays, contains a number of fine lathes, capstans, planers, gear cutters, and a large boring mill for foundation plates. A 10-ton electric crane commands the centre bay. Three bays of the works are relegated to the girder department, one for the setting out, plate planing, and straightening, one for bending and straightening sections under the hydraulic presses, and sawing off to lengths with band and circular saws, and the third for drilling and riveting—the rivets being heated by oil furnaces burning tar refuse. Overhead electric cranes serve each bay; and there are several single-rail side cranes, besides two 10-ton cranes running outside the shops to the store yard. Various turntables, sluice girders, and overhead crane girders were seen in course of construction. On visiting the foundry—all iron castings are produced at the works—it was seen that the shop was well arranged with core ovens, sand-mixing machines, &c. The iron and coke are lifted to the cupola staging by an electric hoist. There are two cupolas—one of 6 tons, and the other of 4 tons melting capacity per hour.

In the fitting shop, a large boring machine, on which crane sides are bored out when mounted on their own foundations, came in for a good deal of attention, as well as the special drilling and screwing machines. Several cranes were here in process of erection, both those of the steam breakdown and electric overhead type; and there were also on view a refrigerator of the absorption type, concrete mixers, hydraulic buffer stops, and other examples of the works' productions.

In the yard was shown how the final erection and testing of the cranes is carried out by means of various travelling steam-cranes. Among others erected for testing were seen a 3-ton tall electric wharf crane—one of an order of ten for South Africa; a 30-ton steam breakdown crane for India; sluices for India and Canada;

water-tanks and hydraulic buffer stops for Egypt; and engine turntables, water-cranes, &c.

The whole party afterwards assembled at the "Crown and Anchor" Hotel to partake of luncheon, on the invitation of Messrs. Ransomes and Rapier—the Chairman and Managing-Director, Mr. Wilfrid Stokes, M.Inst.C.E., presiding. The local guests included the Mayor of Ipswich (Mr. P. W. Cobbold), the Town Clerk (Mr. W. Bantoft), the Borough Surveyor (Mr. E. Buckham), and Mr. Harold Jefferies (of Messrs. Ransomes, Sims, and Jefferies). At the conclusion of luncheon, after "The King" had been honoured, Mr. S. Bylander proposed "The Town and Trade of Ipswich," to which the Mayor replied, prefacing his remarks by a few words of welcome. "Continued prosperity to Messrs. Ransomes and Rapier, Limited," was submitted by Mr. Dunn, and heartily received. Mr. Stokes, after acknowledging it, proposed "The Junior Institution of Engineers," which was responded to by Mr. Kilburn.

The members were then taken in hand by Mr. H. Jefferies, who, with the assistance of the General Manager and heads of the various departments, conducted them over the extensive and busy works of Messrs. Ransomes, Sims, and Jefferies, while the ladies, under the guidance of Mr. Kettle, were shown places of historic and Dickensian interest for which Ipswich is so famed.

As is no doubt generally known, the Orwell works of Messrs. Ransomes, Sims, and Jefferies produce traction engines, road locomotives (simple and compound), small tractors, single and double cylinder portable engines, horizontal and vertical compound, and single cylinder stationary engines, stone corn mills, electric and other power overhead traversing cranes, pneumatic drills, dry back boilers with superheaters, &c.

Probably one of the most interesting instruments shown was the hardness testing machine—the invention of Mr. Brinell, a Swede. This was seen in the tool room near the tool shop. A hardening furnace with automatic pyrometer, buffing, grinding, milling, shaping, and other machines were also examined with keen appreciation, as were the capstan and turret lathes, the special lathes for connecting-rods, valve-rods and axles, the piston-rod grinding, magnetic chucks, cylinder boring machines and drills, slotters, &c.

In the foundry, the excellent system noticeable throughout the whole works was apparent—the sand mixers, six cupolas, special appliances used in the production of iron and brass castings, machine moulding, pneumatic moulding machines, &c. In the smiths' shop were to be seen all in full swing—olivers, hydraulic forging presses, steam and pneumatic hammers, Bradley hammers, bolt-making machines, &c. The boiler-shop, as noisy as ever, gave members the opportunity of seeing how rapidity of execution and accuracy could be simultaneously attained; much thought having evidently been given to the design and arrangement of the plant, consisting of plate furnaces, hydraulic presses, flanging machines, plate rolls, shears, plate-edge planers, air compressor, drills, hydraulic riveters and cranes, electric overhead traversing and power cranes, portable hydraulic riveters, and pneumatic caulking and tapping machines.

In the wood-working department, the visitors' attention was called to a large stock of logs ready for reducing in the saw mills. Here was shown a horizontal log band-saw, saw-sharpening machines, band, circular, and other saws, and sawdust and wood refuse exhausting plant; the boilers being fed with this refuse. Time only permitted of a walk through the thrashing machine department, where the frames and parts of the machine were being expeditiously turned out. Here were to be observed wood lathes, planing, mortising, and sand-papering machines; the processes in the production of metal parts for thrashers and tea machinery. In the machine shop were still more lathes, shapers, slotters, multiple drills, boring machines, &c. Mr. Jefferies, pointed out that all their engines, thrashing machines, &c., are thoroughly tested before leaving the works, so that the high reputation of "British made" shall be maintained beyond the shadow of a doubt. There was so much to occupy the two hours set apart for the Orwell works that it was not possible to visit the Company's lawn-mower works, where the complete manufacture of all kinds of lawn mowers is carried on. It is equipped with its own foundry, machine, erecting, and testing shops, paint shop stores, and warehouses.

Another reunion of the party took place at the "Crown and Anchor" for afternoon tea on the invitation of Messrs. Ransomes, Sims, and Jefferies. The thanks of the members for the extremely interesting afternoon they had spent were expressed by Mr. R. Krall; and Mr. Jefferies having in a few words said how pleased his Company had been to receive the Institution during their visit to Ipswich, the party were shortly afterwards on their way to the station to join the Cromer express for Norwich; dinner being negotiated *en route*. The "Maid's Head" Hotel, so quaint and antiquated, proved a quite comfortable head-quarters during the members' sojourn in the ancient city.

Visit to the Norwich Gas-Works.

On Tuesday morning, the members were met by Mr. Thomas Glover, M.Inst.C.E., the Engineer and General Manager of the Norwich works of the British Gaslight Company, and under his guidance examined with the closest attention the many features of interest for which these works are distinguished. Mr. Glover told his visitors that the annual production of gas was over 574 million cubic feet, about 420¼ millions being coal gas and the remainder carburetted water gas. Of coal, 38,000 tons were carbonized annually, while 156,000 gallons of oil and 2381 tons of coke were used in addition to 5700 tons of coke for the regenerative furnaces for the manufacture of producer gas for heating the retorts. The coal is received from South Yorkshire by water, and delivered on the river alongside the coal-store. It is elevated by a bucket elevator at the rate of 30 tons per hour, and passes through an automatic weighing-machine on to band conveyors which transport it into the store, having a capacity of 7000 tons. Thence it is elevated into hoppers in the retort-house, and from this point transferred to the stoking machine.

The action of the De Brouwer combined charging and discharging machine was explained by Mr. Glover, who pointed out how the current for actuating it was conveyed to, and returned from, the machine by overhead bare cables and trolley arms, at 220 volts pressure. An idea of the power required for working was obtained from the fact that the circuit-breaker is arranged to break the circuit at about 20 amperes less than the fuse-blocks are arranged for on the switchboard in the power-house. These fuse-blocks blow at 100 amperes. The circuit-breaker is a safeguard for all motors on the machine; and in the event of an overload on any of them, it prevents destruction to the armatures or the mechanical breakdown of the machine.

The projector motor is of about 6 H.P., and shunt wound; but on some machines it has been found necessary to use a similar motor of greater power to deal with the modern practice of heavy and full charges. The charging drum is moved on the starter only making about 800 revolutions per minute when it is full on. When about to charge a retort, the speed is accelerated by advancing the handle of the field controller, so putting resistance into the field magnet coils until the motor is working about 1900 revolutions per minute, giving the charging belt a lineal velocity of about 3500 feet per minute when charging. On this speed being attained, the coal-hopper is opened to the feed; the feed motor having previously been started. The coal descends through the telescopic shoot into the grooves of the pulley, and is projected into the retort. As the charging proceeds, the handle of the field controller is gradually lowered, taking out the resistance and diminishing the speed as the charge of coal nears the machine end of the retort.

Upon completion of the charge the coal feed is shut off, and the handle of the field controller is lowered to zero when the motor is running on the starter only, until the machine is ready to deal with the next retort. It is found that about 8½ H.P. maximum is required to completely fill a retort 22 in. by 16 in. by 21 ft.; the time taken being 45 seconds. About 10 H.P. maximum is required to expel the charge; the load, of course, being a decreasing one from the time of starting to push the charge. All the motors are of the enclosed type; and in many cases fins are cast on to facilitate the dissipation of the heat generated. Their positions on the machines are arranged as far away from the bench as possible. In the case of the projector motor, the fan is enclosed in a box. Current is supplied from a 37 k.w. generator of Laurence Scott and Co.'s construction. The same generator supplies power to the motors driving the coke-conveyors.

Mr. Glover showed the members that the machine had the unusual addition of a mechanically operated tray under the charging belt. This device was to enable the "Norwich" chambers, which are 3 feet deep, 12 inches wide, and 21 feet long, to be filled with coal. He explained that the chambers were the first of their kind to be used on a gas-works in this country, and that they were designed with a view to the use of larger units than the ordinary Ω-shaped retorts, and to produce a better quality of coke than ordinary gas coke. Since these chambers had been put into use, by further adaptation of the De Brouwer machine, the Ω-shaped retorts had been filled and longer periods of carbonization adopted. The quality of the coke from the Ω-retorts was now almost equal to that produced from the chambers.

The De Brouwer coke-conveyor, compressed air plant, for the West stoking system, the water-gas plant, including the De Laval turbine running at about 25,000 revolutions per minute, and the mechanics' shop and smithy, were open to inspection; and at the Bishop Bridge works, Mr. Glover showed the exhausters, purifiers, station meters, gasholders, and the workshops of the distribution department. The latest gasholder erected, on the Gadd and Mason spiral-guided system, was seen; the tank being 120 feet in diameter, and 35 feet deep. It has three lifts, and a total capacity of 1,100,000 cubic feet.

At the conclusion of the visit, the ladies, who had been doing some of the sights of Norwich, joined the members; and the party partook of refreshments on the invitation of the Chairman and Directors of the British Gaslight Company. Dr. W. E. Lilly voiced the members' feeling of appreciation of all that had been done to make the visit so pleasant and profitable; and Mr. Glover, in a few well chosen sentences, replied.

Tuesday afternoon was spent in visiting Norwich Castle, by invitation of the Corporation, and under the conductorship of the Curator—Mr. Frank Leney—who was full of interesting information about the wonderful collections of birds, reptiles, historical relics, and other objects under his charge. At four o'clock, the Cathedral was visited, under special arrangements, by courtesy of the Dean; the service being attended subsequently. The music was specially selected, having regard to the attendance of a body of engineers.

An Excursion Day.

Wednesday was fully occupied by an excursion on the Broads, and was greatly enjoyed. Mr. Harold Collins, the Assistant City

Engineer of Norwich, acted as cicerone. The party left Norwich for Wroxham, where launches were in readiness for a morning's cruise to Cottiehall, returning to Wroxham for luncheon at the "Horse Shoes" Hotel. In the afternoon, Salhouse and Ranworth Broads was the programme. After tea at the "Horse Shoes," the party returned to Norwich.

Inspection of Messrs. J. & J. Colman's Works.

The Carrow works of Messrs. J. & J. Colman, Limited, were visited on the following morning, through arrangements due to the courtesy of Dr. James Stuart, M.A., who was formerly Professor of Applied Mechanics at the University of Cambridge, and is now one of the Directors of these great works.

On entering, the members and ladies accompanying them had the pleasure of listening to a succinct lecturette, illustrated by specimens, on the subject of the growth and production of the mustard plant, treatment of the seed, and its manufacture into the yellow powder of the dinner table. They were then conducted to the crushing machine room, where the actual making of the mustard commences. From large hoppers and bins the seed rattles down into a whirr of wheels, to be ground and reduced to powder. It has then a certain degree of roughness, which quality disappears in the process of sifting. This is carried out by means of a number of eccentrically revolving tables. All husk and seed are thus effectively separated; white and brown seed being treated separately, and the product mixed in order to form the various qualities of mustard, of which there are about half-a-dozen. The making of the tins was then shown; some extremely ingenious machinery being employed. The oil yielded by the mustard seed is used for various purposes—some for lubricating the machinery at the works. It also possesses medicinal virtues for the treatment of rheumatic complaints, to say nothing of the "sinapism" as the plaster is called, which, when taken off in the morning, does not bring the epidermis away with it.

In making the boxes, the tin plates are run through cutting machines and sheared off into strips of the requisite lengths, dozens at a time. They then pass on to the stamping machines, and bent ready for the bottom to be attached. The bottoms and covers are produced in another stamping machine; all the operations being performed with remarkable celerity. The making of the wood boxes was shown; attention being called to the speed and precision with which the nailing machine worked—the nails being fed from an elevated hopper. The weighing and packing of the mustard, labelling of the tins, and other incidental operations were being carried on, and showed how nimble the human finger could become; the deftness and quickness of the girls engaged on this work being quite astonishing.

The visitors were afterwards taken to see how blue is made. It was explained that there were indigo blue and ultramarine; but the latter was rapidly displacing the former. Indigo was a vegetable, but ultramarine a mineral, and as such could be worked easier and gave quicker results. The powder is carefully weighed and then sent to a circular table perforated with square holes the size of the squares of blue. These are filled with the powder, which is compressed into a solid block. The blocks are then dried for three or four days, after which they are ready for packing.

The starch works were also visited; it being shown that rice was the raw material used in its manufacture. In its first stages, the blocks are dried in ovens heated from 120° to 170° Fahr. They are then carefully scraped to get the outside crust off, and are then wrapped and tied in paper and baked in another set of ovens, after which they are cooled down.

The party were subsequently the guests of Messrs. Colman at luncheon in the Criterion Restaurant—Mr. Adcock in the chair. Mr. Krall expressed the Institution's acknowledgments of the interesting morning the members had spent, and of the hospitality that had been extended to them. Late in the afternoon, the party left Norwich for Cambridge; the "University Arms" Hotel being the head-quarters.

The Hopkinson Laboratory.

The following morning (Friday), the members were welcomed by the President, Professor Sir J. J. Thomson, and Professor Bertram Hopkinson at the Hopkinson Laboratory, over which they were shown, as also over the Physical Laboratory, where Sir Joseph conducted some striking experiments with liquid air. The whole of the apparatus and appliances were fully explained; the members listening with special interest from the fact that Professor Hopkinson is the son of an honoured Past-President, the late Dr. John Hopkinson, F.R.S.

Soon after leaving the laboratories, the party gathered in the Cambridge Guildhall Council Chamber, where they were received in civic state by the Mayor, Alderman G. Stace, J.P. In addressing a few words of welcome to them, he expressed the pleasure felt by the Corporation that Cambridge had been included in the places to be visited during the Institution's itinerary in East Anglia, and said he was sure the members had been greatly edified by their visit that morning to the physical and engineering departments of the University. Sir J. Thomson, in responding, referred to the long period of his residence at Cambridge, and paid a high tribute to the excellent work carried out by the Corporation in seeing to the hygienic well-being of the inhabitants, and in providing means for their recreation. The party were then entertained at luncheon by the Mayor, after which Mr. W. L. Raynes, a member of the Corporation, gave a short recital on the organ in the large hall.

At half-past two, the members assembled in Trinity College Chapel, where the Organist (Dr. Alan Gray) rendered a selection of music. After this, the President led the party to the famous dining hall of the college, where so many celebrated men have sat, and then on to the college library, designed by Sir Christopher Wren, in which were seen the series of busts by Roubilac, Thorwaldsen's statue of Byron, exquisite carvings by Gibbons, the MSS. of several of Milton's poems, a large collection of coins, and many rare books and manuscripts.

The members attended the service (unaccompanied) in King's College Chapel, and in the evening the Institution's summer dinner was held at the University Arms Hotel—Sir J. J. Thomson in the chair. Among those present were Sir J. Larmor, M.P.; Mr. Mollison, member of the University Senate; Alderman Stace, Mayor of Cambridge; Professor M'Lennan, of the University of Toronto; Mr. Thomas Glover, Engineer and Manager of the Norwich station of the British Gaslight Company; Mr. J. W. Auchterlonie, Engineer and Manager of the Cambridge Gas Company; Dr. W. E. Lilly, of Dublin; and Professor T. H. Richardson, of the Civil Engineering College, Sibpur, Bengal.

After the loyal toasts had been honoured, Mr. S. Bylander proposed "The University and Town of Cambridge, and the Proprietors of the Works, &c., open to the Visit of the Institution during its Summer Meeting in East Anglia." The toast was acknowledged by Sir Joseph Larmor (St. John's College), Alderman Stace, and Mr. Thomas Glover.

Professor Sir J. Thomson, in proposing the toast of "The Universities of our Dominions beyond the Seas," said he had had many opportunities of seeing the facilities which the Universities in the Colonies afforded to students of engineering; and in Canada and the United States they found laboratories admirably equipped for the teaching of engineering. There was a great demand for the students; and practically each year's graduates were absorbed by the engineering profession. In many cases, they could not find enough men for the appointments open. This was a condition of things they would be glad to see in this country.

Professor M'Lennan, in responding to the toast, admitted that they were very proud of their engineering school at Toronto; but he said there were matters on the practical side of engineering to which they might give more attention. One was in respect to the ventilation of their buildings, in which the United Kingdom was far ahead of them. Another was the finish and permanence of their works. British bridges did not fall down as did the bridge over the St. Lawrence. They had much to learn as to the supply of water to their great cities. Typhoid fever was prevalent in the large towns; and at Toronto, while they were on the banks of a lake 200 miles long and 40 miles broad, the public water supply was so bad that they had to drink distilled water. Their engineers were not specially trained in municipal engineering, and so they could not create great works like those furnishing the Manchester and Birmingham water supplies.

Mr. Auchterlonie submitted "The Junior Institution of Engineers." He referred to the important work it was carrying on in the interests of the junior members of the profession, though he said he noticed that many of the existing members could hardly call themselves junior engineers. Their continued association with the Institution must, of course, be of considerable advantage to the younger members, who had the benefit of their companionship and professional help. He also alluded to the devoted work of the Secretary, Mr. Dunn, whom gas engineers also knew well as the Secretary of their own Institution.

Mr. B. E. Dunbar Kilburn, in acknowledging the toast, thanked everyone who had assisted to make the Institution's summer meeting in East Anglia so pleasant and instructive. He said the members sincerely appreciated what had been done for them; and he alluded to the recent election to honorary membership of the Institution of Professor Bertram Hopkinson, of Cambridge, Mr. Thos. Glover, of Norwich, and Mr. Wilfrid Stokes, of Ipswich.

The toasts were interspersed by a programme of music provided by the Chorister Glee Singers (most of them from the College choirs), and was greatly enjoyed.

Cambridge Scientific Instrument Company's Works.

On the following morning the works of the Cambridge Scientific Instrument Company were visited. Here were seen in course of construction all types of pyrometers—including the platinum resistance, the thermo-electric, and the radiation patterns. The platinum resistance pyrometers are usually the most accurate, and are largely used in commercial and scientific work for temperatures up to about 900° C. The Féry radiation pyrometers, which, as "JOURNAL" readers may remember, are manufactured by the Company, were seen, and their construction and application were explained. They can be employed commercially for measuring any temperatures above 600° C, though they are chiefly used for the higher temperatures where the other types of pyrometers are not so suitable. For pottery-kilns, gas-retorts, steel-furnaces, &c., they have an extended application. Thermometers and mechanical instruments were also seen in course of manufacture. Extensometers and repeated impact testing machines were shown. The latter are particularly useful for testing the quality of such steels as are to be used in motor-engine parts, or in any position where they will be subject to repeated reversals of stress. A large comparator was being completed for use in comparing the standards of length which are being employed in the Geodetic Survey of India. Of electrical instruments, the Duddell oscillograph, used for recording alternating current wave-forms on any alternating current circuit up to 50,000 volts, was shown; and the

Einthoven galvanometer, the Duddell thermo-galvanometer, and a large variety of other scientific instruments of all kinds, were seen in actual working condition.

The garden party given by the President and Lady Thomson at "Homeleigh," West Road, Cambridge, formed a most agreeable termination to a week full of interest and enjoyment. A number of notable University people had been invited to meet the members; and the time was pleasantly spent in conversation beneath the trees on the lawn over ices and seasonable articles, and in listening to the stringed orchestra discoursing music.

In the evening the party dispersed in all directions—some to return to London, others to sunny Felixstowe, and others to Ireland and other parts of the kingdom. Thus ended the Juniors' summer meeting of 1911, which was voted as being one of the best arranged in the whole course of the Institution's history.

RECENT GASHOLDER TANK CONSTRUCTIONS IN HOLLAND.

The Dutch paper "De Ingenieur," has published an article on new types of gasholder tanks which have been adopted for gasholders in some Dutch works in recent years. The following summary is taken from the "Journal für Gasbeleuchtung."

Based on the fundamental idea of Intze, that a horizontal iron bracing ring should take up the horizontal forces and only leave the vertical forces to be dealt with, a new patent has been taken out. According to the latter, the inner wall is divided into a number of segments consisting of vertical iron cylindrical bulged walls attached to vertical columns, as shown in fig. 1. The bowed walls transmit the water pressure directly to the vertical columns, so that the resultant R of the left and right hand pressures, P G, is directed by the columns to the centre of the gasholder. If all the columns are propped or stayed on the centre, the construction is in equilibrium.

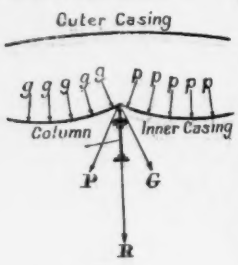


Fig. 1.

An example of this type of construction on a large scale is afforded by the gasholder of about 3½ million cubic feet capacity at the Western Gas-Works at Amsterdam, the fundamental principle underlying which may be seen from fig. 2. Both the large dimensions of the inner chamber (which has no central column) beneath the gasholder, and the way in which the vertical columns of the inner wall of the tank are relieved of weight during the filling of the annular tank, are very remarkable. The middle of the bottom of the tank is constructed as a reservoir, holding water to a depth of 17 inches instead of, as usual, holding only a little water. The weight of this water causes a pressure on the inclined stays, which transmit it to the forty columns of the inner wall. This makes it possible to have a lighter construction. Notwithstanding careful execution, tangential deflections in the angle-pieces of the props, and deflections from the vertical of some of the vertical columns necessitated two tension-rods being inserted crosswise in each bay in the year 1904.

The construction of the tank of the gasholder of 2,120,000 cubic feet capacity at the Eastern Gas-Works at Amsterdam is shown in fig. 3. This is provided with a heavy compression-ring in order to avoid the deflections referred to; and, on filling, it gave rise to unpleasant surprises. The circular tank consists of an annular base, a cylindrical outer wall, and thirty-six bulged segments, which together form the inner wall. The relief of the weight on the vertical columns when the middle portion was filled with water and the ring was filled at the same time, was attended by a twisting of the whole structure about the axis of the gasholder by 1·18 feet. This incident taught the lesson that cross diagonals should never be omitted whenever they could be applied.

In addition to the tank wholly of iron, a type has been introduced in which iron is retained for the outer wall, but is given up for the base. The difficulty in this construction is in joining the upright wall to the rigid concrete base. Of the different combinations, the constructon patented by Scheuss and Cool, which is specially applicable to annular tanks, has been much used. The inner wall of the horizontal base of their annular tank consists of masonry, concrete, or reinforced concrete, and the outer wall of iron or steel, see fig. 4. The advantage of this combination lies in the utilization of the special qualities of the different component materials—*i.e.*, the outer wall is of iron to take up tensional strains; while the inner wall is to take up compression strains and to prevent flexures. Apart therefrom, there is an economy of first cost as compared with the annular iron structure. By using a water-tight iron lining, one-fifth to two-fifths of an inch in thickness over the concrete, which is one with the outer wall, the escape of the tank water is avoided if cracks occur in the inner wall or in the concrete bottom.

In 1904, such a gasholder of 1,060,000 cubic feet capacity was erected at the gas-works on the East Sea Dyke at Rotterdam.

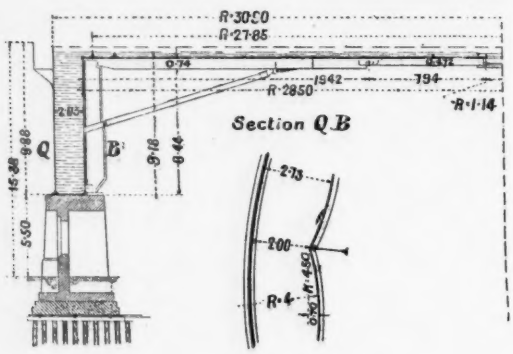


Fig. 2.

Dimensions in Metres.

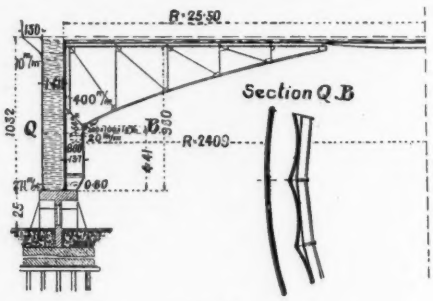


Fig. 3.

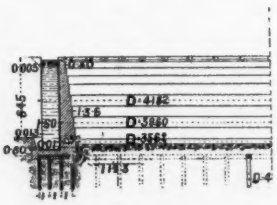


Fig. 4.

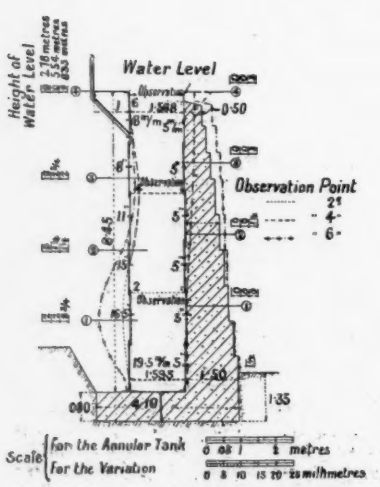


Fig. 5.

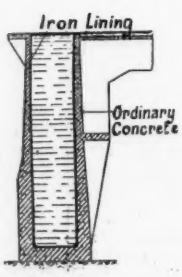


Fig. 6.

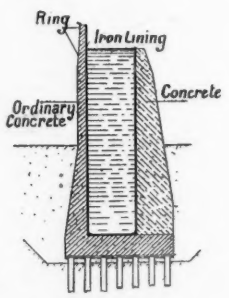


Fig. 7.

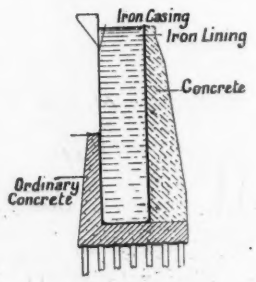


Fig. 8.

The construction of the annular portion of the tank of this holder is shown in fig. 4. There are also, in addition to this holder, in Holland the following specimens of the same construction with or without an accessible inner vault: At Rotterdam, two gasholders of 1,500,000 cubic feet capacity; at The Hague, one of 2,120,000 cubic feet, and one of 2,500,000 cubic feet capacity; at Zwolle, one of 630,000 cubic feet capacity; at North Scharwoude, one of 42,380 cubic feet.

In the first and second cases in which this system was applied at Rotterdam, the tank was, when completed, filled with water in order to test whether the riveted seams were tight and the different parts were sufficiently strong. In four places diametrically opposed, and at four different levels, the alterations in the tank were measured both inside and outside at different levels of the water; and the conclusion was drawn therefrom that the greatest tensional strain occurring in the outer wall did not exceed 17,064 lbs. per square inch. Fig. 5 shows the alteration of the cross section on filling. The iron was soft, and not the hard iron prescribed in the German standard prescriptions; and the concrete for the masonry consisted of one of cement to three of sand and six of gravel.

The use of reinforced concrete for the outer wall of a complete tank, and the use of a compression wall in masonry, concrete, or reinforced concrete, led the Dutch engineers, Rutger and Cool, to the idea of placing the bottom of the gasholder below the level of the ground, in order to circumvent the difficulties of construction with elevated large tanks. They thus avoid the great thickness of the lower portion of the vertical wall and the dangerous bending strains at the junction of the base and side walls. Figs. 6, 7, and 8 show different constructions, of which the one shown in fig. 8, in which the wall is partly of reinforced concrete and partly of iron, is the most economical. Such an outer wall can be used either for a complete tank or an annular tank and in conjunction with an inner wall of concrete or reinforced concrete.

UTILIZATION OF BLAST-FURNACE GAS.

In connection with the fiftieth anniversary of the granting of the Charter of the Massachusetts Institute of Technology, a congress of technology was held at which Mr. E. M. Hagar presented a paper on "The Utilization of Blast-Furnace Waste."

The author pointed out that, until the last decade, practically the only utilization of the wastes or bye-products of a blast-furnace was the use of a portion of the waste gases to raise the temperature of the incoming blast through heating the brickwork in so-called hot stoves; and in some cases a small portion of the power value of the gases was obtained by burning them under boilers to generate steam for driving the blowing-engines. At the present time, the calorific value of the waste gases is being utilized directly in gas-engines for blowing purposes and for generating electric power; a considerable portion of the slag is used in the manufacture of portland cement; and the flue dust, consisting of the finest ore and coke particles, is being collected and converted so as to be chargeable again into the furnaces. He showed that the aggregate saving or profits resulting from these three developments is a matter of millions of dollars per annum, and in a modern blast-furnace plant it would almost seem that pig iron was the bye-product—indeed, the investment in the equipment to utilize these former wastes exceeds that of the blast-furnace itself.

In the course of his work, the writer has come in contact with these evolutions, with plants in operation, or under construction, of a capacity to produce 12,000,000 barrels of portland cement per annum from slag and limestone, using upwards of 1,300,000 tons of slag in a year. These plants are driven entirely by electric current generated by gas-engines directly from the waste blast-furnace gases; the power requirements being 40,000 H.P. for 24 hours every working day. By using the blast-furnace gases directly in combustion engines, after suitable washing to remove the grit, the power obtained from a given amount of gas is equal to at least two-and-a-half times that obtainable by burning the gas under boilers for generating steam for use in steam-engines. A modern blast-furnace of the usual size, with gas blowing-engines and gas-engines driving electric generators, will provide sufficient gas to furnish 7000 kilowatts electric power, in addition to driving its own blowing-engines. This permits the most modern steel-works practically to do away with the use of coal for power purposes; operating the rolling-mills by means of electric power from the surplus gases.

A water-tunnel which had been in service 35 years in Chicago was recently found to be clean, and looking as if it had just been built, according to the City Engineer's report. The tunnel has been abandoned, as it crosses diagonally under the business district of the city, where it is likely to be injured by sinking caissons for deep foundations. It has a 7-feet internal diameter, and is lined with three rings of sewer brick, laid in cement mortar. Inspection of one portion of it showed that most of the old line and grade points as run by the engineers during construction were in position, and a large percentage of the station numbers were still found on the sides of the tunnel. For the entire length inspected, no leaks, cracks, or other defects were apparent.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Gas Engineering Workers' Wages.

SIR,—In the issue of the "JOURNAL" for Aug. 15, p. 442, reference is made, under the above heading, to a report that we came to terms with our men after a few days' stoppage. This statement is incorrect. As a matter of fact, the advances were conceded without any stoppage of work on the part of any of our men.

WEST'S GAS IMPROVEMENT COMPANY, LIMITED.
F. J. WEST, General Manager.

Miles Platting, Manchester, Aug. 19, 1911.

Corrosion of Service-Pipes.

SIR,—I will answer the question contained in Mr. M'Leod's letter of last week in true Scotch fashion, by asking others of a far more pertinent character.

Is it correct to speak of a subsoil containing moisture as a moist subsoil? Is it correct to speak of a subsoil containing salt water as a brackish subsoil? If so, then I submit that it cannot be wrong to speak of a subsoil admittedly containing acids as acidiferous. That is the sole question at issue. I have declined, and shall continue to decline, to widen the controversy by following Mr. M'Leod on the other points which his letters have raised.

If it is suggested that it is a question of degree, then my answer is that these and similar terms are simply general descriptions, which possess no exact quantitative value.

Leeds, Aug. 18, 1911. WALTER HOLE.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Last Friday, the following Bills, in which readers are interested, received the Royal Assent by Commission: Ashborne and District Gas Bill, Chapel, Whaley, and District Gas Bill, Chasetown Gas Bill, Chester Water Bill, Gas Orders Confirmation Bills (Nos. 1 to 4), Gas and Water Orders Confirmation Bill, Gloucester Corporation Bill, Halifax Corporation Bill, Hornsea Urban District Council Bill, Ipswich Corporation Bill, Kingston-upon-Hull Corporation Bill, Local Government Provisional Orders (Gas) Bills (Nos. 1 and 2), London County Council (General Powers) Bill, Margam Urban District Council Bill, Marple Urban District Council Gas Bill, Merthyr Tydfil Corporation Water Bill, Metropolitan Water Board (New Works) Bill, Northampton Corporation Bill, Oystermouth Urban District Council Bill, Paignton Urban District Council Bill, Rhondda Urban District Council Bill, Rotherham Corporation Bill, St. Helens Corporation Bill, Sidmouth Gas and Electricity Bill, Swansea Gas Bill, Thames Conservancy Bill.

HOUSE OF COMMONS.

South Metropolitan Gas Company's Workmen and the National Insurance Bill.

In the "JOURNAL" last week (p. 429), the answer by the Chancellor of the Exchequer to Sir Henry Kimber's question on the above subject, was given. Sir Henry, it may be remembered, pointed out that the workmen in the employ of the South Metropolitan Gas Company would, under their sick fund, gain all the benefits afforded by the National Insurance Bill, except that relating to maternity, at considerably less expense than under the Bill; and he wished to know whether they, and any similar body who provided not less favourable terms than those offered by the Bill, would be excluded from the compulsory clauses. Mr. Lloyd George replied that as every penny contributed by the employers and workmen under the National Health Insurance would be applied exclusively for the benefit of the workmen under their own administration, it followed that they could not lose through being brought under the Bill, and since they would have the State grant in addition to their own contributions, it further followed that they must gain. If they could so manage the fund as to provide larger benefits than the minimum indicated in the Bill, they would be in a position to enjoy them. He added that he was not prepared to penalize all the best-managed provident funds by withdrawing State aid from them.

Arising out of Sir Henry Kimber's question were several others. Mr. H. W. Forster asked the Chancellor of the Exchequer whether he was prepared to put the Treasury in the position now occupied by the employer, who guaranteed the benefits. Mr. Lloyd George said he thought that, on reflection, the honourable member would be the very last to support such a suggestion, because the only guarantee of good management was that those who managed should suffer if they did badly. Mr. Shirley Benn inquired whether the society to which the gas men in question belonged would be considered an "approved" society within the meaning of the Act. Mr. Lloyd George said that he should not like to answer the question without seeing the conditions. He should not have thought that there would have been the slightest difficulty, under the Bill, in their adapting themselves in such a way as to become an "approved" society.

Cancer among Workers with Pitch.

Some days ago, Mr. Perkins gave notice of his intention to ask the Home Secretary whether, in view of the fact that the spread of cancer among workers with pitch is attributed to the anthracene contained in tar and pitch derived from gas-works, in that tar and pitch coming

from blast-furnaces is free from anthracene, he would take this fact into consideration in the new Home Office regulations, given in the "JOURNAL" for the 1st inst. (p. 293). Mr. Winston Churchill replied to the question on Monday last week as follows: The fact that blast-furnace pitch is much less liable to give rise to cancer is already recognized in the draft regulations which have been issued by the Home Office for the manufacture of patent fuel (briquettes) with the addition of pitch. Factories and workshops in which no pitch other than blast-furnace pitch is used are specifically exempted from the regulations. It is not, however, certain that anthracene is the constituent of ordinary pitch to which the prevalence of cancer in the industry is due.

LEGAL INTELLIGENCE.

COWDENBEATH GAS COMPANY'S SHARES.

Judgment in Favour of the Pursuers.

Last Thursday, Lord ORMIDALE issued his judgment in the action by Alex. Waddell and Forbes Waddell against James Hutton, in which evidence was heard before his Lordship in the Court of Session at Edinburgh in July last (see "JOURNAL" for July 11, p. 115). The pursuers sued for £1010 as the amount of the loss they had sustained through the defender not taking up for them the proportion effeiring to their shares of a new issue of 300 shares in December, 1906. The shares were £10 each, but were, it was averred, of the value of £20 each; and the number the pursuers claim to have been entitled to was 101. Defender said that, under the agreement between them, it was not required that the pursuers should get part of the new shares.

Lord ORMIDALE, in the course of his speech, said: The first question I have to determine is whether or not the defender, James Hutton, failed to communicate the offer of new shares to the pursuers; and whether they were otherwise aware of the intended issue. The averment of the pursuers is: "He (Hutton), however, did not inform the pursuers of the said offer of shares or of the said intended issue thereof, and the pursuers were not aware thereof." The defender, in answer, admits that he was offered the proportion of shares effeiring to the number of shares registered in his name, "and that he did not inform the pursuers of the offer made to him." *Quoad ultra* he admits the pursuers' averment, and explains that pursuers were aware of the necessity of further capital for the Company, of the contemplated issue of 300 shares, of the intention of James Hutton to take up no more than 79 shares, and of the issue of shares made by the Company. It is perfectly clear that no formal notice was sent to the pursuers of the issue of the new shares. It was not incumbent on the Company to send such notice to the pursuers, for their names were not on the register of shareholders. But the defender Hutton was the Chairman of the Company; and as the other Directors were nominees of his, I have little doubt that the true position of Hutton, with respect to the majority of the shares standing in his name, was perfectly well known to them all. It was certainly quite well known to Mr. Brown Tweedie, who was the Law Agent of the Company, and also of Mr. Hutton. There is no record in the minutes of the Directors of any intention on their part to issue new shares prior to Aug. 28, 1906—the date of the annual meeting of the Company. At that meeting Hutton, who was Chairman, mentioned that the Directors were considering the erection of a coal and coke handling plant, and of a new holder, &c.; that these works would involve the raising of more capital, probably to the extent of £3000; and that the necessary shares would be offered to the present shareholders at par, in proportion to their present holding. The only shareholder, other than the Directors, who was present at the meeting was Mr. Alex. Wilson. There is no doubt Mr. Wilson was an intimate friend of the pursuers; and it was maintained that he informed the pursuers of what passed at the meeting. I do not think that this is proved. On Nov. 19, 1906, at a meeting of the Directors, it was resolved to issue 300 new shares; and the Secretary was empowered to intimate accordingly to the shareholders—"the shares to be offered in the first place to the shareholders of the Company in proportion to their present holding." The Secretary was instructed to name Nov. 28 as the last day on which application could be made, and, further, to call a meeting for Dec. 3 for the allotment of shares. The Directors proceeded to allot the new shares. To the defender Hutton, 79 were allotted, and varying numbers of shares were allotted to seven other persons. The names of three of them were not on the register. They got 80 shares among them; and to Mr. Brown Tweedie, who was already the holder of ten shares, but only as the nominee of Mr. Hutton, and who declined to take up the *pro ratâ* number offered to him, 80 shares were allotted. Nothing could have been simpler or more straightforward than for the defender Hutton to have given notice to the pursuers of the Directors' resolution of Nov. 19. But the evidence satisfies me that to bring the position early before the pursuers was the last thing the defender desired to do, and that his aim and object was, if he had the legal right to do it, to prevent the pursuers from participating to any extent in the new allotment. I can come to no other conclusion than that the defender deliberately refrained from making the pursuers aware of the intended new issue, and of the course which he proposed to follow with reference to the shares which would be offered to him in respect of those which he already held as security for the advances made to the pursuers. In marked contrast to his conduct on the occasion of this issue, it may be noted that, in connection with the issue of shares made in October, 1905, he intimated to both the pursuers that the Directors proposed to make a further issue, and that the shares would either be taken up by himself or by the firm of Alder and Mackay, whose nominee he was. It is not surprising, therefore, that in cross-examination the defender says: "Between Nov. 19 and Dec. 3 I never intimated to either of the pursuers that I had the offer of the allotment, or consulted them as to what they wanted to be done." The defender's attitude towards the pursuers' right to get an allotment was such that he says that if they had offered him payment of the first instalment on the shares which they maintain should have been offered them, he would have declined to accept it. Such being the position taken up by the defender, it seems to me idle to inquire very closely into the evidence which is said to support the defender's contention that, admitting that the defender did not inform them, the pursuers were aware otherwise of the intended issue of shares. This contention is based mainly on evidence, chiefly that of the defender himself, of meetings between the defender and Alex. Waddell, in the summer and autumn of 1906, and appears to me to be in direct contradiction of the admission made by the defender. It is said that the position was at these meetings disclosed to the pursuer, Alex. Waddell. This is not proved. I think that Alex. Waddell was aware, but only in a general way, that fresh capital would be required. He was also aware that the Directors proposed to bring in outsiders—a course to which he strenuously objected. But it is not proved that Alex. Waddell was made or became aware, before the issue of the shares, of the number that were to be issued, or of the intention of the defender to keep the pursuers from getting any. There seems to be no evidence at all that the pursuer Forbes Waddell had any knowledge whatever of the proposed issue, either from the defender or from his brother, Alex. Waddell; and it is not proved that there was any arrangement that Alex. Waddell was to act in any way for Forbes Waddell in connection with the Company matters. If the pursuers had been a little more alert, they might have ascertained more than they did; but they cannot, because of their inactivity, be held responsible for remaining in ignorance of what was actually occurring, as in a question with the defender, who, *ex hypothesi*, had imposed on him the duty of letting them know about the new issue, and who could have implemented this duty without the slightest difficulty. The next question I have to decide is whether, if the pursuers had been notified of the allotment of 101 shares, they would have been willing and able to take them up. I think it is proved that they would have been perfectly willing to do so. As to their ability to do this, there is more difficulty. They could not themselves have provided the cash—not even, I think, for the first instalment. Nor do I consider that they had the right to insist on the dividends falling to them on the shares held for them by the defender being applied to the acquisition of fresh shares. In my view, the option was—under Article 15 of the agreement with the first parties—to apply the dividends either towards the pursuers' indebtedness to Hutton, or to the purchase of new shares. In point of fact, the total amount of dividends to date had been already applied towards reduction of the debt. On the other hand, the shares, when issued, were worth considerably more than par; and I think that it is a reasonable inference to make from the whole evidence that the pursuers could have, either by obtaining an advance from a bank, or by getting a friend to purchase the shares, after allotment, from them, placed themselves in a position to reap the full benefit of the new issue. It is also clear that the possible financial inability of the pursuers to take up shares was not present for a moment to the defender's mind. The third question is what damage have the pursuers suffered by reason of the defender's failure to notify them of the new issue of shares? This must be answered, in my judgment, according to the value of the shares in December, 1906, when they were issued. I do not think that there is any relevant averment of damage resulting from the alleged loss of control in the management of the Company's affairs. The Dean of Faculty was in a sense well founded in saying that, by the sale of twelve shares by Forbes Waddell in January, 1905, the equality in the management was already lost. But twelve shares were comparatively negligible, as compared with 101 shares. My difficulty is in estimating the value of the so-called right of control. I do not find in the evidence any materials for aiding me to make such a valuation. In considering the question of the value of the shares of the Company as at December, 1906, it has to be kept in view that the Company was really a new concern when it was reconstructed in 1900. In my judgment, the fact that the Company had been reconstructed in 1900 did not tend to make the shares a less desirable investment. It was a prosperous Company from the start in 1900, and after three years' existence paid a dividend of 8 per cent. The next year—1904-5—it paid 9 per cent.; for each of the next three years, 10 per cent.; in 1908-9, 9 per cent.; and in 1909-10, 7½ per cent. Accordingly, in December, 1906, the dividend had steadily risen from 8 to 10 per cent.; and it was known that the Company was in a flourishing condition. I do not propose to examine at length the evidence of Mr. Millar and other witnesses, who found the diminution of the dividend on special causes concerned with the administration of the Company. There had been a further extension of the capital since 1906—viz., in 1909—and it appears natural enough that the comparative profit should diminish until the full benefit of the enhanced capital should be reaped. I see no substantial reason for thinking that the affairs of the Company were administered in anything but a careful and economical way. The payment of capital charges out of revenue, which appears to be, in effect, the point at which the hostile criticism of the pursuers is directed, must ultimately strengthen the financial position of the Company, and so enhance the value of its shares. It may be quite true that there is no market, in the stockbroking sense, for the shares of the Company; but, on the other hand, it seems to me clear that for the shares of such an undertaking there may be, and that in the present instance there truly was, a special market. Anyhow, there does not appear to have been any difficulty on the part of the Waddells, when they wished to dispose of shares, in finding a purchaser. The defender Hutton admits that the shares issued in December, 1906, were worth more than par value. He says £12; but then admits that he might sell his own shares, if he were hard up, for £18. The parties to whom the shares were at that time allotted were keen to get them; and they were all persons who had an intimate knowledge of the Company. On the whole matter, I value the 101 shares, to which the pursuers had right, at £17 10s., as in December, 1906. I believe that a higher price might have been obtained at the time for a small number of them; but if the pursuers had had to sell the whole 101 shares—as I consider they probably would—I think that only a smaller price would have been realized. I think that the possible issue at par, or at a price less than the true market value, of further shares, was present to the minds of purchasers at the prices referred to. I shall accordingly grant decree in favour of the pursuers against the defender Hutton for £757 10s., with interest on this sum at 5 per cent. per annum from June 4, 1908, when the last call was paid, with expenses.

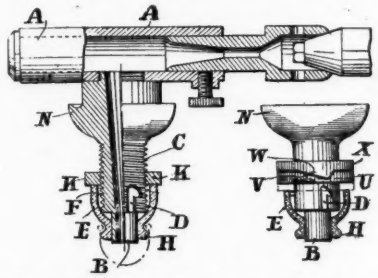
REGISTER OF PATENTS.

Burners for Incandescent Gas-Lamps.

STILL AND SONS, W. M., of Hatton Garden.

No. 17,428; July 22, 1910.

This invention has reference to burners for incandescent gas-lamps of the inverted type, and is more especially designed for use as a high-pressure burner in railway carriage and similar lamps.



Still and Sons' High-Pressure Inverted Burner.

The burner, which is usually screwed into the mixing-tube A, is formed with a lower cylindrical portion B and, above this, with an externally screw threaded portion C, of larger diameter, and in which are formed a number of recesses D of approximately inverted V or equivalent shape; one limb of each recess having its lower end open, and usually being disposed parallel to the axis of the burner. The mantle-support E is in the form of a cup provided with internal lugs F corresponding in number and position to the recesses in the burner, and formed with an aperture in its base through which the lower part of the burner projects, and which it more or less closely fits. The base of the cup has an external bead H, around which the neck of the mantle is contracted. On the upper part of the screw-threaded portion C of the burner is mounted a collar K; the arrangement being such that, the lugs of the mantle support having been caused (by an upward movement followed by a rotary movement) to enter the closed end parts of the inclined limbs of the V-shaped recesses, shaking or disengagement of the mantle support can be prevented by screwing-down the collar until it meets the top of the support. The collar at the same time serves to close the passage M between the support and the burner when the burner does not closely fit the aperture in the base of the support. Usually the burner is formed with an enlargement N, of partly spherical form, above the screw-threaded portion C; and its bore tapers slightly from the upper to the lower end.

As will be understood, the burner may be modified, as shown. Thus, instead of a nut or collar screwed upon a threaded portion, in some cases, a collar U, mounted on a non-threaded part, may be forced and held down upon the support E by co-operating cam surfaces V and W formed on the collar U and a flange X on the burner.

Gas-Burners for Heating Apparatus.

WITHERS, J. S.; a communication from E. G. VAN ZANDT, of St. Louis, Mo., U.S.A.

Nos. 17,779, 17,780, 17,781; July 26, 1910.

These three allied specifications fully describe many arrangements of gas-heating burners, applicable to several types of apparatus.

The first specification relates more particularly to the class of burner described in patent No. 6763 of 1908; and it has for its object to provide a burner for heaters in which "approximate perfect combustion" is produced in such a manner that all the "poisonous gases of the products of combustion" are consumed, so that thereby "the atmosphere is not impaired by the commingling with it of the poisonous gases." By the burning of these gases, the heat produced thereby is said to be added to the heating effect by means of which the total heat efficiency is very large, and the efficiency of the burner therefore a very good one.

In his prior specification, he described a burner or heater having an initial burner surrounded by a horizontal cylindrical shell which has restricted openings in its flanged ends and a V-shaped longitudinal opening in its top. The present invention includes the above features, and also further improvements in construction which are fully described with reference to five sheets of drawings and pointed out in the claims. These summarized indicate that the arrangement patented comprises an "initial" burner, with a cylindrical shell surrounding it, and having inwardly projecting flanges at its open ends to provide restricted end-vents, and a V-shaped opening in the upper part of its wall, extending longitudinally of the shell and terminating approximately at the flanges. A flat or curved horizontal plate is disposed over the opening at the top of the shell. A plurality of longitudinal or transversely disposed vent openings are provided in and near the top part of the shell or container, and the plate arranged over them. There are openings alone, or openings and projections or tongues combined thereon, extending partly over the openings of the plate, while the openings of the plate are disposed over the openings of the shell.

The second invention is likewise said to relate to gas-burners for heating apparatus, more particularly the class of burner described in patent No. 6763 of 1908; the object of the improvements being "to provide a burner which will bring about almost complete combustion of the gases so as to prevent the dissemination of poisonous gases in the atmosphere, and to burn these poisonous gases so that the heating effect of the burner is correspondingly increased."

Here the claim is for a gas-burner comprising a container or shell of circular shape, and having a plurality of perforations in the top, or of semi-cylindrical spherical or annular shape and having at the top a restricted slot or slots of V-shaped axial section, and an initial burner within the container, with downwardly and inwardly projecting flanges or retarding partitions around or on opposite sides of the top opening or openings. The burner has a horizontal cylindrical shell with restricted openings at the top, with a large opening in the bottom of the shell. A curved and outwardly-extending flange forms a chamber on each lower edge of the shell; the flange extending upwardly concentrically to the shell so as to form a guide-channel from the chamber, and having its discharge opening or spout adjacent to the openings of the shell. It is provided with openings communicating with the interior of the shell and with the chambers and openings in the top of the latter.

As to the third "invention," it also is a variant of the 1908 patent already referred to. As before, its object is stated to be "to provide an improved gas-burner by means of which the gas may be almost entirely burned, and the products of combustion thereof subjected to heat and air treatment in such a manner that any combustible gases therein, or formed thereby, are also completely consumed." The nature of the invention consists in a shell or container over an initial burner, which shell or container has a closed top and gathers the products of combustion of the initial burning. The thus collected products are subjected to the further heat of the initial burner, until the shell or container is filled, when the products of combustion of the initial burner flow out of the bottom of the shell. The invention consists, further, in such a shell or container and a cylindrical rim, spaced apart from the shell and slightly longer than the shell or container.

Separately Delivering at Equal Pressures Two Gases Received under Unequal Pressures.

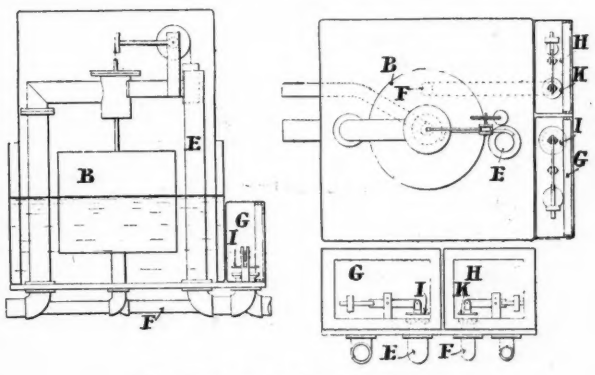
IONIDES, A. C., jun., of Porchester Terrace, Bayswater, W., and SWAN, J. B., of St. John's Wood, N.W.

No. 18,267; Aug. 2, 1910.

This apparatus, for separately delivering at equal pressures two different gases or fluids received under unequal pressures, is applicable for use in connection with the production of a combustible gas of approximately unvarying composition capable of being readily burnt and formed of a mixture of definite proportions of air with a suitable inflammable gas (preferably ordinary coal gas) within apparatus ready for delivery into the main or before distribution through the service-pipes.

It has been proposed, the patentees explain, to burn acetylene with a mixture of air; the admixture taking place in the flame by conducting the gas and air under equal or proportional pressures to the burner. For this purpose, apparatus has been devised whereby air and gas under unequal pressures have been passed through separate gasholders, the bells of which have controlled inlet valves and have been so connected together that increase of volume in one of the bells caused the valve of that bell to close and open more fully the valve of the other bell, "so that the pressures of air and gas delivered separately to a two-jet burner bear a uniform ratio."

The apparatus suggested comprises a closed chamber, an inverted bell adapted to float in water (or other suitable fluid) to act as a seal contained within the chamber, valved inlets to the chamber, and a bell for the air and gas respectively, and adapted to be controlled by the movement of the bell, and suitable outlets from the chamber and bell for the escape of the air and gas under equal pressures.



Ionides and Swan's Pressure Equalizer.

A front elevation (partly in section) of the apparatus is shown, together with a plan with the covers removed, and a side elevation.

The apparatus comprises a closed chamber containing an inverted floating bell B, adapted to act as a seal, contained within the chamber. C D are valved inlets to the chamber and bell for the air and gas respectively, and adapted to be controlled by the movement of the bell. E F are outlets for the escape of the air and gas under equal pressures to the mixing-chamber (not shown). The bell is counterpoised in any convenient manner—preferably, as shown, by a counterweight, pulley, lever, and flexible connection with the top of the valve spindle. In order to prevent any excess of pressure in the mixing-chamber affecting the proper working of the bell which controls the valves, the outlets E F, instead of opening directly into the mixing-chamber, are arranged to deliver into two separate closed chambers through check valves I K, so arranged that any back-pressure from the mixing-chamber through the outlets of the chamber will cause the valves to close. The air, under pressure, enters through an opening C controlled by a valve, the spindle of which is carried directly by the top of the bell. The gas,

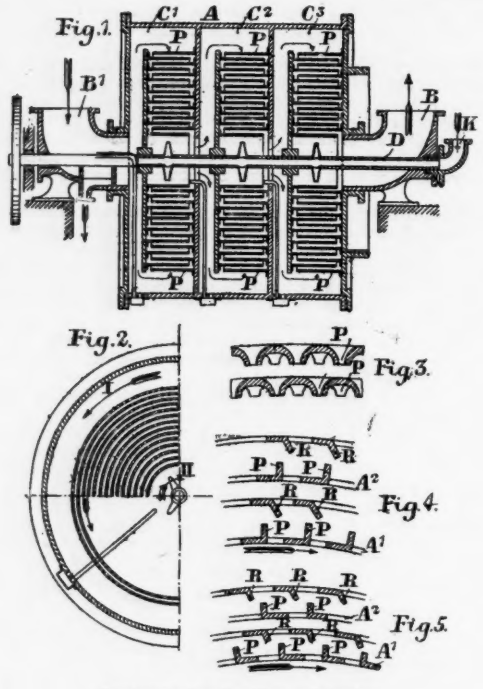
also under pressure, enters beneath the bell by a pipe, the outlet D of which is controlled by a valve whose spindle is also directly carried by the top of the bell. The outlet pipes E F, from the air-chamber and gas-bell respectively, are preferably of less cross sectional area than the inlet pipes to the chamber-bell.

Purifying, Cooling, and Mixing Gases.

THEISEN, H. E., of Munich.

No. 22,433; Sept. 27, 1910.

Apparatus resembling disintegrators for purifying gases are well known, the patentee remarks, in which between concentrically arranged bars mounted on the casing other bars (also concentrically arranged on a revoluble disc) rotate, and in which gas and water are so introduced that a thorough spraying of the water takes place between the bars, and so there is a mixture of the water with the gas to be purified. Disintegrator-like apparatus for washing gases are also known, in which drums provided with apertures are arranged concentrically in a casing, and in which bars rotate (in the intervals between the drums), provided with slots for the purpose of introducing the water. It has also been proposed to pass the gas and liquid between two sets of intermeshing concentric cylindrical plates rotated in opposite directions; the plates being provided, if desired, with slots to secure additional space for the passage of the gas and liquid. In this class of apparatus, the centrifugal action is used to separate out the particles of liquid suspended in the gas and not to disintegrate the washing water admitted at the outer periphery of the conical plates. Further, the outlets for the condensed liquid and the washing water are also at the periphery of the apparatus, so that the washing water can escape before it has been brought into intimate contact with the bulk of the gas being treated. The gas is made to pass through perforations in large drums, so as to provide ample condensation surface for the liquid particles.



Theisen's Gas Purifier and Cooler.

According to the present invention, a similar form of apparatus is used in which the construction is modified in order to bring the washing water and the gas into intimate contact. The apparatus so modified is essentially a disintegrator; the plates being rotated with the object of breaking-up the particles of water as finely as possible, so that the maximum surface is exposed to the gas. Further it is desired to continually expose fresh surfaces of water; and hence the water is made to pass through the whole series of drums, which are arranged either to rotate in opposite directions or for one set of drums to rotate while the other set is held stationary. With this arrangement, the water is sprayed by one drum on to the next, where it is first partially condensed and collected and then sprayed again on to the next drum, and so on through the series of perforated drums.

The apparatus consists substantially of perforated cylinders or conical shells, which rotate relatively to one another or are partly rotating and partly stationary, and which are arranged concentrically in one or more chambers; the apertures of the rotating cylindrical or conical casings being preferably formed as suction nozzles, and the apertures of the fixed cylindrical or conical casings having inwardly bent baffle or deflecting walls and bars. This arrangement is particularly advantageous if the mutually rotating or partly rotating and partly stationary perforated cylindrical or conical casings are constructed in the suction chamber of a centrifugal or fan washer, concentrically with the washer axis, in such a way that the gas must first pass through them before it reaches the centrifugal or fan washer.

Various forms of this disintegrator-like cleaning apparatus are shown in the drawings attached to the specification.

The particular form shown in figs. 1 and 2 consists of a horizontal rotating continuous cylindrical drum A, which has gas inlet and outlet apertures B^1 B^2, and is mounted in bearings. The shell or outer drum A is divided by partitions into a number of chambers C^1, C^2, C^3, &c. The partitions between the chambers have circular slots in the middle, and have on the left-hand side concentrically arranged perforated sheet-metal cylinders, while the right-hand side remains free. The cylinders are riveted or screwed to the partitions by angle irons. The drum, with the partitions and the cylinders, rotates in the direction of the arrow I fig. 2.

Discs firmly keyed on a rotary shaft D project into the chambers C^1, C^2, C^3; being mounted in bearings and driven by a belt pulley. The discs have on their right-hand sides concentrically arranged sheet-metal cylinders, which project into the intervals between the other concentric sheet-metal cylinders without encountering the cylinders themselves. The shaft D (with the discs and cylinders) rotates in the direction of the arrow II fig. 2. Spaces are left between the uncoupled right-hand sides of the partitions and the left-hand sides of the discs, as shown.

The gas enters at B^1, and is forced by the partitions to travel forward in the direction of the arrows in fig. 1, in order to reach the gas-outlet B^2. The washing liquid is carried in an opposite direction. It enters at K, flows through the shaft D, and escapes from it, by means of sprinkling pipes, into the gas-chamber.

In order that the washing liquid may pass from one chamber to another and be carried forward to the end, recesses (provided externally on the periphery of the drum A) are connected by apertures with the respective chambers and by pipes with the interior of the next chamber. The cylinders are provided in any suitable way with apertures as shown in figs. 3, 4, and 5.

Fig. 3 shows an arrangement in which the apertures are conical, and formed in such a way that the portions remaining between them are as round as possible in shape. The drum or casing A may also be arranged so as to be stationary. The apertures of the rotating cylindrical and conical surfaces are then preferably provided with baffle-plates or projections by bending upwards the parts formed when the rectangular and triangular apertures are punched. On the rotation of the apparatus, these projections have a centrifugal action on to the next fixed baffles, which may also be punched out triangularly.

Fig. 4 shows a similar arrangement, in which A^1 A^2 are the rotating cylindrical and conical surfaces; P^1 P^2 the fixed cylindrical and conical surfaces; P the upwardly bent rectangular projections of the rotating cylindrical and conical surfaces; and R the downwardly bent projections of the fixed cylindrical and conical surfaces.

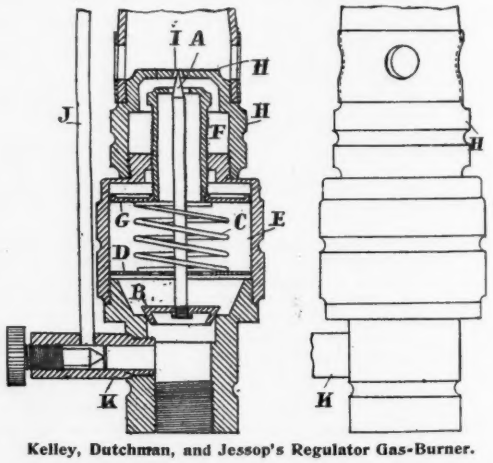
It has been found that deposits of dirt were formed behind the rotating bent up projections shown in fig. 4. In order to avoid this drawback, it is preferable to arrange the apertures directly behind the projections, as in fig. 5, so that the water spurting through them washes clean the rear of the projections, while deposits of dust against the front of the projections P are prevented by the centrifugal force.

Automatic Lighting and Governing Gas-Burners.

KELLEY, F. A., of Ecclesall; DUTCHMAN, E., of Sheffield; JESSOP, S., of Hathersage.

No. 23,036; Oct. 5, 1910.

This invention relates more particularly to a type of gas-burner in which the gas-reservoir is fitted with a plate or cup covering the gas-supply orifice, and having attached to it a conical needle valve reaching upwards into an outlet orifice in the top of the gas-reservoir, and surrounded by a coiled spiral spring; the pressure of the entering gas causing the plate or cup and the conical needle valve to rise or fall, and so close or open the gas-outlet. It is somewhat similar in general arrangement and action to that described in Gozzard's specification No. 1671 of 1909; the improvement consisting in a modification of the internal construction, arrangement, and adjustment of the valve.



Kelley, Dutchman, and Jessop's Regulator Gas-Burner.

The patentees dispense entirely with the independent small cylindrical conical ended valve and its chamber; and in lieu of it form the end of the main valve stalk with a coned end which fits into an inverted seat on the underside of the orifice I, so as to obtain a direct action of the secondary valve A, by the movement of the main or primary valve B. They also dispense with the arrangement of weights by which they are able to make this main valve B of less diameter than the valve in the former patent, so that a smaller surface is exposed to the pressure of the gas, besides which, by dispensing with the weights, it is no longer necessary to open the body of the valve when adjustment is required.

In lieu of the weights, a helical spring C is used, formed of some non-corrosive metal or metallic alloy; and by having a reduced area

of valve, a comparatively small tension on the spring is necessary to keep the day pressure down, so that when the increased night pressure comes on less power is required to lift the valve. On the stalk above the main valve is fixed a flange or disc D (approximately fitting the gas chamber or reservoir E) on which is placed the helical spring, and several small holes are made in the disc in the vicinity of the stalk to facilitate the passage of the gas. In the cover of the gas-chamber is a hollow screwed plug F, of sufficient length to allow of the spring being regulated and adjusted to the required amount of tension, which is effected by a milled collar on its outer end. Across the opening is placed a bridge or guide through which the valve stalk is passed and retained in a central vertical position. On the inner end of the plug a disc G is attached for the upper end of the helical spring to abut against. Above the cover of the gas-chamber is a cap or nipple H, which encloses the plug F; and in the centre of the nipple is a small coned orifice I, the underside of which forms a seat for the conical end of the stalk of the main valve. This constitutes the secondary valve by which the area of the small central orifice in the nipple may be increased or decreased by the varying pressure of gas on the main valve B. By this arrangement, it is only necessary to remove the nipple H to obtain access to the plug F by which the burner may be regulated to suit various pressures.

When the main valve B is closed down on its seat, no gas can pass through this central orifice to the burner; but when a light night pressure is turned on, the main valve has a sufficient lift to allow of a supply of gas to pass through the valve; thence through the orifices in the flange or disc D; and thence into and through the gas-reservoir E, and upwards through the hollow screwed plug F, through the central orifice I in the nipple H in sufficient quantity to allow the burner to give a normal jet for illuminating. As the pressure increases, the main valve lifts higher and proportionately closes the orifice I in the nipple by the secondary conical valve, through which the supply to the burner may be gradually decreased or increased so that a normal illuminating jet may be maintained.

The pilot light J is supplied by a connection K, placed below the main valve B, so that it is not affected by the movement of the valve and remains always alight.

Coke-Ovens and Retort-Furnaces.

STETTINER CHAMOTTE-FABRIK AKTIEN-GESELLSCHAFT, vormals DIDIER, of Stettin, Germany.

No. 6924; March 20, 1911. Date claimed under International Convention, Sept. 12, 1910.

This invention relates to coke-ovens, retort-furnaces, and the like, used in the manufacture of coke and lighting gas having horizontal heating flues and gas-supply conduits formed in the heating walls between the retort-chambers—the object being "to improve the efficiency of such furnaces."

Accordingly, the individual heating flues are provided with several gas-supply conduits (each with a regulating valve) opening into the heating flues at different distances from the air-inlet end of the flues. By so arranging the gas-conduits, only a portion of the heating gas is introduced into the heating flues near the air-inlet end, where it is burnt with an excess of air. The products of combustion give off a part of their heat when passing through the heating flues, and their temperature is thus reduced. To replace the heat given off by the products of combustion, additional supplies of gas are introduced at certain distances in the length of the heating flues; this additional gas combining with the excess of air, already present, and being thus consumed—ensuring "uniform heating of the retorts and therefore economical working of the furnace."

If the heating flues are horizontal, gas-conduits arranged in this manner may be used in connection with vertical as well as horizontal retorts for gas manufacture, coking, or the like.

A construction of furnace according to the invention is illustrated. Fig. 1 shows the furnace in longitudinal section, on the left-hand side on the line 6, and on the right-hand side on line 7. Fig. 2 is a cross section, which, starting from the left, is carried out on lines 8, 9, 10, 11 of fig. 1. Fig. 3 is a horizontal section, which, starting from the top, follows the lines 12, 13, 14, 15 of fig. 1. Fig. 4 is a vertical section on an enlarged scale through a portion of a gas-distributing box on the line 15 of fig. 3. Fig. 5 is a horizontal section on an enlarged scale through a gas-distributing box on the line 16 of fig. 1.

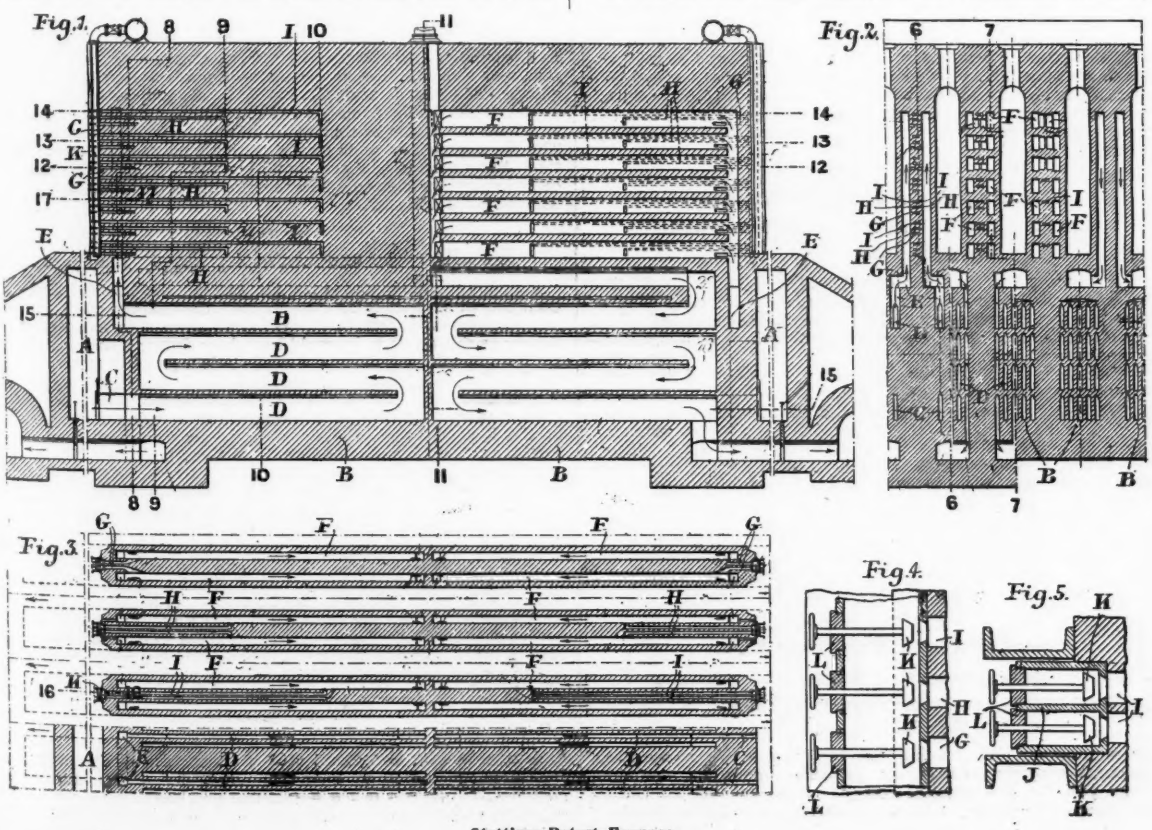
In the example illustrated, a horizontal retort or coking-furnace is shown heated at either end. The retorts extend from one end of the head of the setting to the other, and are separated from each other by heating walls, in which are horizontal heating flues arranged in both halves of the setting, one set being arranged in pairs parallel to each other, and in two vertical series separated from each other by central partitions. In the centre of the setting, partitions are provided between the groups of heating flues of each half of the setting.

The furnace operates in the following manner. Combustion air passes through the tunnel A, below the bottom of the furnace, into the inlet conduits of the recuperators B in each half of the setting; the quantity of the air admitted being regulated by a slide-valve. Owing to the removal of combustion air from the tunnels, fresh air will constantly flow into them; so that they will be properly cooled. From the inlet conduits C the secondary air passes into the superimposed conduits D of each recuperator, through which it flows in the direction of the arrows, and in which it is subjected to preliminary heating. Thereupon the air is admitted through the angular conduits E into the vertical air-distributing conduits at the head of the furnace. From these latter conduits the air passes into the various heating flues F, in amount regulated by valves.

The main quantity of gas required for heating each individual flue F enters the latter through the lowest of the respective conduits G, H, I—*i.e.*, through the conduit G, which opens into the heating-flue near the air-inlet end. The supply of gas delivered by the conduit is burnt in the heating-flue with an excess of air; and the products of combustion, in flowing through the flue towards the centre of the retort-setting, give off a part of their heat to the retorts, and thus the temperature of the gases is reduced.

If only products of combustion which are continually falling in temperature were used to heat the retorts, the latter would not be heated uniformly—that is to say, the amount of heat imparted to them would diminish towards the centre of the setting, so that distillation or coking would be completed in different periods of time and "economical working of the furnace would be prevented." To replace the heat given off by the products of combustion, additional supplies of gas are introduced through the conduits H I situated above the conduits G into each heating-flue at varying distances from the air-inlet end, and burnt with the excess of air contained in the products of combustion. This "ensures the most uniform heating possible of the retorts" throughout the whole length of the flues.

The height of the outlet openings of the gas-conduits increases, as



shown in fig. 1, towards the centre of the setting—that is to say, towards the discharge end of each heating-flue. Thus, as the excess of air diminishes as the products of combustion pass towards the discharge end of the flues, the mixture of the additional heating gas with the air is facilitated.

Uniform distribution of the heating gas in the pairs of conduits in each half of the heating wall is rendered possible by the arrangement of the vertical partition J (fig. 5) in each gas-distributing box. The quantity of gas flowing from each box into the individual conduits can be regulated by the valve K at the head of the furnace.

As will be seen from the foregoing, the combustion gases always flow in the same direction from each end of the furnace to the centre of the setting through the heating flues F. Owing to the arrangement of the gas-conduits G, H, I, opening into the heating flues at different distances, the heating in the retorts described can be regulated as required by means of the gas-regulating valves K, not only as regards the height, but also as regards the length of the retorts, "so that economical working of the furnace is rendered possible."

The waste gases, on escaping from the heating flues F, pass in front of the valves by means of which the draught produced by the chimney in the flues can be regulated. From the flues the waste gases pass into the vertical conduits arranged in the centre of the setting, and thence into the horizontal sole flues under the retorts. The guiding of the waste gases through these sole flues is merely intended to maintain the temperature in the bottom portion of the setting, but not to assist coking from below. From the sole flues the waste gases, in passing into the recuperator conduits, give off heat to the fresh air flowing in the opposite direction through the adjoining conduits. From the former, the waste gases pass finally to the main or smoke flues leading to the chimney.

By unscrewing and removing the glands L (fig. 4) of the regulating valves K controlling the supply of gas to the conduits G, H, I, these conduits can be cleaned by suitable implements introduced through the openings provided. Any dirt contained in the conduits is then forced towards the centre of the setting, and falls through the outlet openings into the respective heating flues F.

Alternately Lighting and Extinguishing the Main and Bye-Pass Flames of Lamps.

JULIUS PINTSCH AKTIENGESELLSCHAFT, of Berlin.

No. 26,191; Nov. 10, 1910. Date claimed under International Convention, Dec. 17, 1909.

This invention relates to apparatus for alternately lighting and extinguishing the main and bye-pass flames of (say) railway carriage lamps or the like, in which gas continues to be admitted to the flame which is to be extinguished for a certain time—capable of regulation—before the supply is completely cut off, while the necessary supply of gas is at once admitted to the burner to be lighted.

The apparatus is distinguished, on the one hand, from one class of such apparatus by the fact that the controlling device is operated by gas diverted from the pipe supplying gas to the burner and not used for burning purposes; and, on the other hand, it is distinguished from another class of apparatus having the same object by the fact that the controlling device is actuated by means of the existing pressure in the gas-main, and without raising the pressure temporarily for the purpose.

The gas passes through a regulating cock, and thence to one of two diaphragm chambers according to the position of the regulator cock, while the other diaphragm chamber is open to the atmosphere. The two diaphragm chambers are arranged in a casing, and in one construction are separated by a third chamber connected at one end with the gas supply pipe, and at the other end with the valve casing containing the valve controlling the burner and bye-pass pipes. The two diaphragms are connected together by a rod, and to the latter is attached the lever operating the valve.

Counting Apparatus for Meters.

BESANCON, J., of La Chaux-de-Fonds, Switzerland.

No. 28,885; Dec. 12, 1910.

The patentee points out that in gas, water, electricity, and other meters in which the consumption is indicated by rotatable discs or rollers—of which one indicates the units, a second the tens, and a third the hundreds, and so on—the use of a spiral spring which is periodically tensioned and untensioned to effect the movement of the meter discs or rollers, is known. As, however, the tension of the spring must be dependent upon the speed of rotation of the meter-disc, one end of the spring is connected to the shaft of such meters and moves with it, while the other end may be secured in any adequate manner.

According to the present invention, neither end of the spring is fixed, but each end is connected to a driving wheel, and the wheels are rotated at different speeds; so that the tension of the spring is still dependent upon the speed or number of revolutions. It is not, however, tensioned so rapidly as was hitherto the case. In this manner, it is possible to use smaller springs, and less power is required for the meter than with the known operating mechanism, even though the mechanism is applied to meters in which the shaft rotates fairly rapidly and the units are only indicated at longer periods of time.

Quenching and Removing Coke.

ADOLF BLEICHERT AND CO., of Leipzig-Gohlis, Germany.

No. 3518; Feb. 11, 1911. Date claimed under International Convention, Feb. 11, 1910.

For carrying out the quenching and removing of coke as described in patent No. 19,287 of 1907, the patentees proposed to use electric rope railways in connection with gas-ovens; but they are said to be not always convenient in connection with chamber and coke ovens. The bulk of the expelled coke necessitates large receptacles—generally too heavy for the structure on which the rope-railway is laid, and specially powerful motors must be provided for the several operations of travelling, lifting, and lowering. Moreover, the local conditions are frequently unsuitable for rope-railways; and a large bulk of coke shot into a tank is liable to splash the water therefrom, and to require considerable time for quenching.

The object of the present invention is to adapt the method referred to, to more convenient use in connection with chamber and coke ovens. According to it, the coke-receptacle is not lowered into, and removed from, a tank which is separately run in front of the respective ovens, but the receptacle and tank are collectively moved in front of the ovens by means of a rope or the like, which, at a conveniently arranged station, also serves for lifting, lowering, and separately removing the receptacle by itself.

APPLICATIONS FOR LETTERS PATENT.

17,922.—LOVE, W. C., "Incandescent gas-burner." Aug. 8.
17,924.—AIRD, K., "Gas-fires." Aug. 8.
17,943.—HANCOCK, C. E., "Lamps." Aug. 8.
17,947.—SUTCLIFFE, J. H., "Carburetting air for lighting, heating, or motive power." Aug. 8.
17,964.—JEWELL, W., "Cooking pan or tin for use with gas and other stoves or cookers." Aug. 8.
18,002.—MARTINI, F., "Generators for acetylene gas." Aug. 8.
18,014.—ALRIQ, P., "Breaking and screening coal and coke." Aug. 8.
18,019.—COOPER, A. G., and WOODROW, D. M., "Purification of illuminating gas." Aug. 9.
18,076.—TUCKER, J., "Gas-cooking stoves." Aug. 9.
18,089.—ZEPLER, E., and SUTTON, T. H., "Incandescent gas-mantles." Aug. 10.
18,108.—RECORD, J. W., and RECORD ELECTRICAL COMPANY, LTD., "Protective coverings for incandescent gas-mantles." Aug. 10.
18,193.—WOLTERECK, H. C., "Desulphuration of coke." Aug. 11.
18,206.—BLOCK, L., "Condensing and cooling ammonia." Aug. 11.
18,222.—HASSALL, W., "Incandescent gas-burners." Aug. 11.
18,277.—REIS, A., "Producing gas from petroleum and other hydrocarbons." Aug. 12.
18,307.—WALTERS, J. C., and GOOD, A., "Leakage detecting devices for gas-meters." Aug. 12.
18,309.—MARCUS, H., "Conveying mechanism." Aug. 12.

Chester United Gas Company.

The accounts presented at the ordinary general meeting of this Company on Monday last week showed a balance of £6466 on the revenue account for the half year ended the 30th of June, and a sum of £5163 available for distribution. The Directors recommended the declaration of an interim dividend on the ordinary stock at the rate of 2½ per cent. In moving the adoption of the report, the Chairman (Mr. J. G. Frost) said that, as they had a balance in hand of £1000 in excess of what was required for dividend, they thought they could safely make some further concessions to the consumers; and they therefore proposed to reduce the price of gas to those using ordinary meters from 2s. 11d. to 2s. 8d. per 1000 cubic feet, subject to the existing scale of discounts. Should, however, the present lamentable state of unrest in the labour market assume more serious national dimensions, the reduction would have to be deferred. The Directors had not thought it wise to refrain from announcing their proposals; but no one who had the slightest interest in the welfare of the country, whether financial or social, could fail to watch with most serious apprehension the momentary tendency of important sections of labour to ignore the advice or counsel even from their own elected leaders. The development or continuance of this tendency must mean something like national ruin, and would certainly preclude the possibility of any reduction in price. The report was adopted, and the dividend recommended declared.

Marseilles Gas and Electricity Supply Last Year.

According to the report of the Directors of the Gas and Electricity Company of Marseilles for the past year, the quantity of gas sold was 1423¾ million cubic feet, or 7·77 per cent. more than in 1909. Satisfactory as this result is, it would have been better if the weather had not been so mild. An installation of vertical retorts was brought into use last November, and the results obtained with it are stated to be very satisfactory. There was a considerable increase in the sale of electric energy, for both large and small powers, due in great measure to the low prices which the Company are compelled to charge to meet the competition in this branch of their business. The amount standing to the credit of the profit and loss account at the close of the year was 1,741,381 frs. (£69,655), and after deducting 5 per cent. for the reserve fund, there was a balance of 1,654,311 frs. (£66,176), out of which a dividend of 5 per cent., or 25 frs. per share, was paid. Of the difference, 89,240 frs. (£3570) went to the Municipality, 10 per cent. to the Directors, and the rest was utilized, with a draft upon the reserve, in paying an additional dividend of 2 frs. 50 c. per share The Municipality profit largely by the Company's prosperity. Apart from the 89,240 frs. above referred to, they were paid for Customs duties and taxes a sum of 607,595 frs. (£24,304), or about 12,000 frs. (£480) more than in 1909. Beyond this, the Company paid last year, in the shape of various other duties, 162,486 frs. (£6499), or an increase of 10,000 frs. (£400) on the sum paid in the preceding year.

The Morecambe Town Council last Tuesday adopted the recommendation of the Gas Committee to accept the tender of Messrs. Parkinson and W. & B. Cowan, Limited, for a new retort-house governor, and agreed to the Committee purchasing a tar-column, an exhauster regulator, and a twin pressure recorder,

MISCELLANEOUS NEWS.

LIVERPOOL UNITED GAS COMPANY.

Reduction in Price.

The Annual General Meeting of this Company was held last Tuesday—Mr. H. WADE DEACON (the Chairman) presiding.

The accounts presented showed that the total revenue for the year ended the 30th of June was £632,606, of which £513,704 was for gas, £15,183 for meter and stove rents, and £102,993 for residual products. The expenditure on the manufacture of gas was £362,488; on distribution, £58,876; and on management, £22,040; rents, rates, and taxes came to £32,046; and the total expenses were £486,533. The balance carried to the net revenue account was consequently £146,073; and the amount available for distribution was £107,803. The Directors recommended that a dividend for the past half year be declared of 5 per cent. on the ordinary consolidated stock and 3½ per cent. on the 7 per cent. stock.

The CHAIRMAN, in moving the adoption of the report, referred to the Standard Burner Act, and said he was glad to be able to state that since the candle power was reduced they had not received a single complaint. They had had a successful year, and there had been 3 per cent. increase in the quantity of gas sold. The working had been better, and upwards of 12,000 cubic feet of gas per ton of coal had been made. The cost of manufacture was down by about £27,000. The income from the sale of gas was £9000 down, as compared with the previous year, not owing to a reduction in the quantity sold, but to reductions in the price charged. The amount received as rents for stoves had increased by nearly £1000. After paying the usual dividends, there would be £54,620 to be carried forward, which enabled the Directors to again reduce the price of gas. He had pleasure in announcing that they had decided to make a reduction of 2d. per 1000 cubic feet, to come into operation as regards ordinary consumers from the 1st of July last, and as regards users of prepayment meters as from September next.

Mr. J. LISTER seconded the motion, and it was carried unanimously.

The retiring Directors and Auditor having been re-elected, a vote of thanks was accorded to the Chairman, Directors, officials, and staff, for their satisfactory management of the Company's affairs.

CROYDON GAS COMPANY.

The Half-Yearly Meeting of the Company was held last Friday, at the offices, Katherine Street, Croydon—Mr. CHARLES HUSSEY, J.P., in the chair.

The SECRETARY (Mr. W. W. Topley) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read.

LARGE INCREASE IN CONSUMPTION.

The CHAIRMAN, in moving the adoption of the report and accounts, said he thought the latter spoke for themselves. They needed little from him in the way of comment—certainly nothing of the nature of justification. One of the most satisfactory features was the increase in the sales of gas. This was at the rate of 8·36 per cent. over those of the corresponding half of last year. For the six months, this represented 52 million cubic feet. In money, notwithstanding that the reductions in price had benefited consumers to the extent of £4208, there was an increase of £3280. This growth in sales had coincided with a greater increase in the number of cookers let on hire than they had secured in any preceding half year. The increase for the six months in gas-stoves on hire, added to the number they had sold in the period, came to 1818. The Company now had on hire 21,363 cookers, and 6472 fires, besides which there must be in use several thousand gas-stoves bought by consumers, either from the Company or direct from the makers. Those on hire alone now bore to the total number of consumers the satisfactory relationship of upwards of 72 per cent. The fact that the increase in the sales of gas was more than proportionate to the increase in the number of consumers warranted the pleasing inference that the use of gas for other purposes as well as those of lighting was growing; and confirmation of this, so far as cooking was concerned, was to be found in the fact that even in the very bright and hot weather that had been experienced they had not only maintained, but substantially improved upon, the daily output. There was little doubt that this year was another instance of the frequent experience of gas companies that sustained hot weather in the early months of summer induced consumers who had not previously cooked by gas to try the experiment; and cooking by gas, once tried, was little likely to be given up when its convenience and economy had been experienced.

POPULARITY OF HIGH-PRESSURE LIGHTING.

The proprietors would have seen from the report that the success so far attained with high-pressure lighting—particularly for the outside illumination of shops—had been such that the Directors had thought it wise to spend a considerable sum in laying a special main for high-pressure gas in the principal retail business thoroughfare—North End, Croydon. They had secured accommodation there for the compressing plant, and had now for some months had several installations working. The advantage of distributing high-pressure gas from their own central station was that consumers were freed from the necessity of providing accommodation for it on their own premises. The Company, for an inclusive quarterly charge, supplied the gas and the lamps, kept them in order, and lighted them for a prearranged number of hours each business day. This gave to the tradesmen who had accepted their offer the best and cheapest outdoor lighting so far discovered, without any trouble to themselves. The favour which the system had met with from those who had adopted it warranted the expectation the Directors confidently held, that this method of shop lighting was destined to grow considerably. They had seen to it that, in this part of Croydon at all events, they would be able as the days shortened, and business hours of lighting lengthened, to deal promptly with the requirements of the consumers.

EXPENDITURE AND INCOME—COAL AND RESIDUALS.

On the expenditure side of the revenue account, there was little calling for mention. The Engineer was again able to show economies in manufacture; carbonizing results in particular showing a well-marked improvement, which he was glad to say was being maintained. Expenditure generally had increased to a less extent than had the sales of gas. On the credit side, they had the gain of £3280 from gas which he had mentioned, and the extremely good increase of £5808 from residuals—a result to which coke, tar, and sulphate of ammonia had all contributed. The cost of the raw materials of the business—coal and oil—less the revenue from residual products, was the lowest the Company had ever reached. For the coming year, they would be receiving coal at a lower cost than in the past year; and so far as could be seen at present, the prospects from residuals—at all events, coke and tar—were good. The use of tar for road treatment continued to find favour with road authorities. This was a good omen for gas undertakings; for so long as they were content to accept a reasonable price, which nevertheless showed a marked gain over that obtainable for distillation purposes, the demand was likely to be a growing one. The Directors fully appreciated the importance of ensuring that this remunerative outlet should not be restricted by seeking to secure the last possible farthing in price; and while they had felt justified in making a small advance, they had not gone beyond a price at which they were assured the use of tar was remunerative and satisfactory to local authorities. He was sure the proprietors would concur in the wisdom of thus sacrificing a small immediate profit rather than prejudice a growing and profitable trade.

NATIONAL INSURANCE.

Those proprietors who had read reports of recent meetings of other large gas companies and of some railway and other companies would have noticed references to the proposals of the National Insurance Bill in their bearing on the interests of the workmen employed in these undertakings. The position of the workmen of most gas companies differed from that of the general body of workmen throughout the country, in that they were already, generally speaking, better secured against the risks of life than they would be under the provisions of the Bill. Take, for instance, their own workmen. They each contributed to the Company's sick fund 4d. per week (the same amount as under the Bill), and received during illness 10s. per week for the first three months, and 8s. for the next three months, against the 10s. and 5s. the Bill gave them. Moreover, they received this from the first day of illness, and whether or no they were receiving payment in respect of an accident arising out of their work, while the Bill would exclude from payment the first week of illness, and would make no provision for cases coming under the Workmen's Compensation Act. They also received, at the cost of the Company, medical attendance for their wives and families, as well as for themselves, where the Bill would provide these for only themselves. He might say that these facts were some months ago brought by the Directors to the knowledge of the Chancellor of the Exchequer and of the Members of Parliament representing the Company's area of supply; and at a general meeting of the workmen called the previous week by their Engineer and General Manager, a resolution was unanimously passed asking the Directors to secure, if possible, that the present arrangements should not be disturbed.

FURTHER REDUCTION OF PRICE AND INCREASE OF DIVIDEND.

He did not doubt that the proprietors would share with the consumers' satisfaction at the announcement that the Board saw their way to make, after Oct. 1, a further reduction of 1d. in the price of gas—the third reduction within twelve months. The Directors felt that the time had come when the holders of the Company's ordinary stocks might rightly look to receive, in the form of a higher dividend, some small share of the Company's increasing profits. They, therefore, recommended, as would be seen, an increase of ½ per cent. per annum in the dividends on the "A," "B," and "C" stocks. It was interesting to note how these changes illustrated the mutual relationship which now existed between the shareholders, consumers, and employees. The changes made the last twelve months represented to the Company a lessened revenue of about £19,800 per annum. Of this sum, the consumers would gain to the extent of £16,800, the proprietors £1600, and the co-partnership employees £1400.

CO-PARTNERSHIP.

The Directors had every reason to believe that the system of "co-partnership" introduced two-and-a-half years ago was justifying itself in the permanent benefits it conferred on the Company's employees, and also in the gain to the Company from the general and wholehearted devotion on their part to its interests which the Directors had always appreciated, and never more so than recently. Practically all their permanent employees—some 530 in number—were now co-partners; and of these at least 370 would be, by the end of next month, also stockholders. He was interested to see, from figures laid before him recently, that, while the total amount of bonus credited to the co-partners had been £4373, they had themselves deposited with the Trustees no less a sum than £2645. In other words, they had voluntarily put by, over and above their bonus, no less than 60 per cent. of its amount. Further than this, up to June, no co-partner had, while in the Company's service, withdrawn any sum placed to his credit as bonus. These facts, they might, he thought, refer to with legitimate satisfaction.

ALLOCATION OF THE PROFITS.

Turning now to the appropriation proposed for the available balance of profit. They had written a further £2500 off the old Caterham works. The sum of £1500 had been placed to the credit of the renewals fund. This now amounted to £5200; and it would be needed in the near future to meet the cost of modernizing the washing, scrubbing, and purifying plant of the old section of the works. The carbonizing part had, as most of the proprietors were probably aware,

been already remodelled. The Board also expected shortly to have proposals laid before them by their Engineer for improving the accommodation available at the works for social and recreative purposes, in the form of the workmen's mess and club rooms, bath-rooms, &c. The appropriations gave them, as available for division, the sum of £40,815; and after payment of the dividends recommended, amounting to £23,524 for the half year, the substantial sum of £17,291 would remain to be carried forward—enough to pay, within £6200, next half-year's dividends.

The Deputy-Chairman (Mr. T. Rigby) seconded the motion, which was unanimously carried.

The Dividends.

Mr. William Cash proposed the declaration of dividends at the rates per annum of 15 per cent. on the "A" stock, 12 per cent. on the "B" and "C" stocks, 5 per cent. on the "D" stock, and 10 per cent. on the "E" stock—all less income-tax.

Mr. Percy H. Hall seconded the motion, which was unanimously carried.

Proposed by Mr. Maitland, and seconded by Mr. Samson, a hearty vote of thanks was passed to the Chairman and Directors.

Mr. Helps' Recent Indisposition.

The Chairman, on behalf of himself and his colleagues, made due acknowledgment, and then proposed a vote of thanks to the Engineer and General Manager (Mr. James W. Helps), the Secretary, staff, and workmen for their efficient services. He observed that no words were really necessary from him to commend this resolution, as, if their officers and men had not done their duty properly, the Board would never have been able to place such a satisfactory balance-sheet before the proprietors as they were enabled to do that day. On the last occasion, at their meeting, their Engineer and Manager was unfortunately absent through a breakdown in health; and that was the first meeting he had missed since he had been in the service of the Company. The fact that the record was broken grieved him very much indeed. They then passed a vote of sympathy with Mr. Helps, and a telegram was sent to him in Spain, assuring him of the deep regret of the proprietors, and wishing him a speedy return to health. He was with them that day, but not in such good health as they could wish. He was, however, about to have his annual holiday; and they all hoped he would come back refreshed and with renewed energy for the winter campaign. As to Mr. Topley, he was one of the best servants they could possibly have, and the same applied to the members of his staff. As to the workmen, in these unfortunate and troublous times in the labour world, it was something to be able to say that they were on the best of terms with their men at the works. In his opinion, co-partnership was no small factor in cementing good relationships.

Mr. Samuel Spencer seconded the motion, which was carried.

Mr. Helps, in reply, said it was a great pleasure to him to once again sit there to listen to the words of approbation that had fallen from the lips of the Chairman and Mr. Spencer, and to hear the hearty manner in which the proprietors approved of them. In the case of their Company, they were fortunately a body every part of the machinery of which was working well to the same end, and not at variance. If it were not for this fact, he was sure they would not be so successful or happy as they were. They had one of the best staffs of workmen any gas company could possibly have. They had had a good test of this during the past few months. As many of the proprietors could quite imagine, a gas-works was not an ideal place in which to work during such torrid periods as they had been experiencing. He had frequently of late gone through the retort-houses when the temperature had stood at three figures; and he had never had a single word of complaint from a single workman. The men did their work as cheerfully under these conditions as under the most comfortable circumstances. He wanted to acknowledge the work of Mr. Caddick, his chief assistant at the works, and of Mr. Sandeman, the superintendent of the distribution department; also the loyalty of the secretarial staff, and of the whole of the employees of all ranks. He concluded with an expression of his deep appreciation of the sympathy of the proprietors towards him at the last meeting, and of the telegram which they kindly sent him.

Mr. Topley remarked that the conditions under which they all worked were such that the discharge of their duty was a pleasure. He acknowledged the cordial co-operation of Mr. Anderson, the Assistant-Secretary, and Mr. Haines, the Assistant-Accountant. Regarding the recent illness of Mr. Helps, his absence was keenly felt by all; but there was one matter which assuaged one's regret during the time—a time during which there was a fairly heavy pressure of work—and it was the cordial manner in which all worked together and pulled together to make things go smoothly and well. That these efforts were in a measure successful was shown by the accounts.

The Chairman, before the proceedings concluded, mentioned that a pressing engagement prevented Mr. Corbet Woodall's presence at the meeting.

ALDERSHOT GAS, WATER, AND LIGHTING COMPANY.

Value of Publicity—Future of Tar.

The Half-Yearly General Meeting of this Company was held on the 11th inst.—Mr. W. T. Robertson (the Chairman) presiding.

The General Manager and Secretary (Mr. R. W. Edwards) read the notice convening the meeting; and the report of the Directors, with the accounts for the six months ended June 30, some figures from which were given in the "Journal" for the 25th ult. (p. 253), was presented.

The Chairman, in moving the adoption of the report, said there had been increased expenditure for coal and oil during the past half year; but this had been more than neutralized by the improved revenue from residuals. In all the repair accounts, there was evidence of the policy the Directors had pursued for many years of maintaining the plant in a high state of efficiency. It had always been a strong point with them; and they were determined to adhere to the principle of maintaining the plant in the very best possible condition, and at the same time to exact the very best returns and results consistent with the material and circumstances. The revenue account contained an item for "publicity and advertising" which appeared for the first time, and would increase as the Company's business expanded. Apart from the local advertisements, which necessarily grew owing to the Directors constantly bringing before the public the economical advantages of the use of gas for various purposes, the Company had agreed to support the new movement recently introduced by the Institution of Gas Engineers in respect to the Publicity Fund, the annual subscription to which was on the basis of 2s. 6d. per million cubic feet of gas sold. That the scheme was quite in the right direction, there was no doubt whatever; and provided that the Special Committee who had been appointed to manage the fund fully realized their responsibilities, the Directors were confident as to the benefit the Company, in common with other gas undertakings throughout the kingdom, would derive from so excellent a movement. The revenue from the sale of gas had increased from £18,125 to £19,671; and it was principally under the heads of private consumers and public authorities. The rentals of meters, cookers, and fires also showed an increase during the six months of more than £141; and it was gratifying to see that gas-fires represented nearly £60. This particular account was very pleasing, because it indicated a new departure in the Company's business. The sales of water showed a small, but welcome, increase. Turning to the residual products, with the exception of breeze they showed a gratifying increase. It promised well to see the returns from tar rising; and the Directors hoped they would be still larger in future. Every effort would be made on their part to see that they shared fully in any increase in trade which might be developed in consequence of the wider use of tar for roads. Naturally, this increased demand for tar for the purpose would take off the market a large quantity which had hitherto gone for distillation; and therefore the Directors concluded that the principal bye-product, pitch, would ascend in value owing to these conditions, and consequently improve the general market in this direction. They looked forward very hopefully to the sale of tar in the future. The revenue account was satisfactory; the balance being £9492, against £8221. The amount on the profit and loss account, after payment of the dividends, was £8326, compared with £7496; but £384 had been taken for writing-down investments and £172 for levelling-up the reserves.

The Deputy-Chairman (Dr. F. Stroyan) briefly seconded the motion; and it was carried unanimously.

On the motion of Mr. Hugh Foster, seconded by Colonel Barker, a vote of thanks was very heartily accorded to the Chairman, Directors, management, and staff, for their services.

The Chairman and Mr. A. F. Wilson (the ex-Chairman) having acknowledged the vote,

Mr. Edwards said he was sure the compliment would be much appreciated by all the staff.

This concluded the business of the ordinary meeting.

A special meeting was subsequently held, at which the Directors were authorized to issue £25,000 of stock, *plus* one-third loan, under the 1903 Order, and a like nominal amount of stock and loan capital under the 1909 Order.

PORTSEA ISLAND GAS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the Offices, Portsmouth, on the 12th inst.—Mr. R. Edgcombe Hellyer (the Chairman) presiding.

The Directors reported that the quantity of gas sold in the six months ended the 30th of June was appreciably in excess of the corresponding period last year—650,762,800 cubic feet, against 613,664,800 cubic feet—and that the number of consumers had steadily increased. The Company's mains had been extended to Porchester; and a supply of gas was being furnished to a number of the residents in the district. The Engineer and General Manager (Mr. J. D. Ashworth) reported that the buildings and plant at the several stations, as well as the mains and meters, had been adequately maintained, and were in efficient working order. The accounts accompanying the report showed that the revenue in the six months was £118,548 and the expenditure £99,521; leaving £19,027 to go to the profit and loss account. The amount available for distribution was £41,025; and the Directors recommended dividends at the rates per annum of 13 per cent. on the "A" and "B" shares, 12 per cent. on the "C" shares, 10 per cent. on the "D" and "E" shares, and 5 per cent. on the stock; leaving a balance of £23,093 to be carried forward.

The Chairman, in moving the adoption of the report, remarked on the highly satisfactory result of the half-year's working, and pointed out that, compared with the corresponding period of the previous year, the quantity of gas sold showed an increase of 36 million cubic feet, that 1555 more consumers had been supplied, and 920 additional cookers and gas-fires sent out. Against an increase of £1414 in the expenditure, the receipts were £5282 in excess of the first half of 1910, and the net profit was £3968 more.

A Shareholder criticized the quantity of gas unaccounted for and the profits made in the fittings department, and also objected to the interest and dividend warrants being signed by the Secretary only.

The Chairman, in reply, pointed out that the percentage of unaccounted-for gas for the half year was 5·34 only, which compared favourably with the experience of other gas undertakings of similar capacity; and that the work and sales executed by the fittings department showed a considerable increase on the previous year, but that the charges to consumers had been reduced in the hope that the introduction of improved fittings and appliances would further popularize and increase the demand for gas. As to the third point, he said the Company's practice conformed with that of other large undertakings, and that safeguards existed against any possible irregularity.

The Deputy-Chairman (Mr. F. M. Aylen) seconded the motion; and it was carried unanimously.

The dividend recommended was declared; and the meeting terminated with a vote of thanks to the Engineer and General Manager, the Secretary (Mr. H. A. Stibbs), and staff generally

GAS SUPPLY IN NORTH LONDON SUBURBS.

Evidence of the growth of two of the northern suburbs of London is afforded by the half-yearly reports of the North Middlesex and the Southgate and District Gas Companies. That of the former Company was presented to the proprietors yesterday; and the other will be submitted at the meeting of the Southgate Company on Thursday.

Compared with the figures for the six months ended June 30, 1910, there was an increase of 6,481,500 cubic feet, or 6·6 per cent., in the quantity of gas sold by the North Middlesex Company; and there was a better return from residuals. The total revenue was £22,631, and the expenditure £17,919; leaving £4712 to go to the profit and loss account. The amount available for distribution was £8360; and the Directors recommended payment of dividends of £10 10s. and £7 7s. per cent. per annum on the original and additional ordinary capital, and the addition of £474 to the reserve fund. This appropriation came to £4005, and left £4355 to be carried forward.

There was an increase of 8,440,500 cubic feet, or 11·2 per cent., in the quantity of gas sold by the Southgate and District Gas Company in the past half year compared with the first six months of 1910; and the returns from residual products were higher by £260. The total revenue was £18,784, and the expenditure £15,055; leaving £5729 to go to the profit and loss account. The amount available for distribution is £7324; and the Directors recommend the payment of dividends at the rates of 10 and 7 per cent. per annum on the original and additional capital. This will require £3012, and leave £4311 to go to the profit and loss account for the current half year. The good position of the undertaking is shown by the fact that in May last an issue of £5000 of additional capital and a like nominal amount of 5 per cent. preference stock, when offered to the public, realized £12,931.

BOURNEMOUTH GAS AND WATER COMPANY.

Extension of Carbonizing Plant on the Vertical System.

The Ordinary Half-Yearly General Meeting of the Company was held last Friday, at the London offices, No. 90, Cannon Street, E.C.—Mr. G. Crispe Whiteley in the chair.

The Secretary (Mr. H. A. Plumb, F.C.A.) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read. The former stated that, in consequence of the increase in the Company's business, the Directors were engaged in the erection of further plant at the Poole gas-works. Additions to the water-gas plant, new retorts on the vertical system, and further purifiers were in course of erection. The Company's central offices at Poole Hill, Bournemouth, had been reconstructed and enlarged. The supply of water had been adequately maintained; but the demand had been exceptionally heavy in consequence of the dry season lately experienced. Further filtration plant was about to be installed at Wimborne. The revenue account, it was also stated, continued to show satisfactory growth under every head. The Directors recommended the payment of dividends, less income-tax, for the half year at the rate of 6, 7, and 15 per cent. per annum on the preference, "B" ordinary, and the original shares respectively. These dividends would amount to £17,620, and leave a sum of £39,112 to be carried forward. The revenue account showed that the income of the half year amounted to £92,556; and the expenditure to £70,508—the gross profit amounting to £22,048.

The Chairman, in moving the adoption of the report and accounts, remarked that ever since the leading case of the children of Israel was decided a great many years ago, it had always been held to be a difficult task to make bricks without straw; and he must confess that he found it increasingly difficult to address the proprietors at any length at their meetings, or to say anything of fresh interest, as there was nothing half year by half year but successful working to record in regard to the Company. To tell the simple truth, there had been another excellent half year. There had been increase on all hands; and the Company was as strong, and even stronger, than it had ever been in its history. Having said this, he thought he could commend the accounts to the proprietors, and ask them to pass on, and simply declare the excellent dividends which the report suggested should be paid. There were, however, one or two points of interest perhaps to which he might allude now that he was addressing those present, not only in their individual capacity, but as representatives of the (nearly) 1400 proprietors of the Company. To begin, he thought that, under the circumstances, and with this weather, the water demands had first claim to notice. This had been a wonderful summer; and he knew that the supply of Bournemouth with water had been a work of anxiety and care, and that there had been an unusual strain upon the Company's resources in order to do it satisfactorily and well. He claimed for the Company a certain amount of praise for having got through the strain successfully, and for having supplied the town and district with an adequate quantity of pure and wholesome water during this trying time. To show what it had been like, he might say that, during the last three months, they had had an increase of 43 per cent. in the consumption, compared with the corresponding three months of last year; and that it had often meant constantly pumping into Bournemouth 4½ million gallons of water per day. His friend the Engineer (Mr. Harold W. Woodall) told him this would represent a lake of 1½ acres square, and 14 feet deep. This would give some idea of the work that they had had to do, and some idea also of the resources that the Company possessed, whereby they could do it. They had been able to accomplish this by the forethought of the past; and the Board were now looking to the future, and were making provision for fresh supplies and fresh means for meeting the increased demands for water that Bournemouth and the district would undoubtedly make. Regarding the gas undertaking, they had had an increase in the consumption of gas, and they had, of course, to meet this growth. They were now hard at work extending the plant at the Poole gas-works; and he certainly need not tell the proprietors that the plant would be of the most up-to-date kind, and the methods of working the most scientific that were now applied. They would have continuous carbonization by means of vertical retorts; and the proprietors would not be surprised to hear this, for they knew it, that the process had been evolved by their own officials, and had been cradled, nurtured, and developed at their own works. There were one or two other matters that called for reference. The chief offices at Bournemouth had for many years been inadequate, and neither worthy of the work that had to be done in them, nor of the Company whose head-quarters they were. The Board had enlarged and improved them; and he thought they were now an ornament to the town. Though a fair amount of money had been expended in decorating and enlarging them, the Company would be amply repaid by the improved working of the staff, and the improved arrangements they could make by having the work done under one roof. It might interest the proprietors to also know that the co-partnership scheme which had now been going on for three years was an absolute and complete success. He addressed a meeting of the staff and the men in July; and he need not say they were pleased with the increased bonus that the Company were able to distribute owing to the reductions that had taken place in the price of gas during the past three years. He might incidentally say that the relationships between the Company and their men were of the most healthy and satisfactory character. Having said this, he thought he could commend the report to the proprietors for their support; their watchwords being—in the past satisfaction, in the present energy and enthusiasm, and in the future complete confidence.

Mr. Corbet Woodall seconded the motion; and it was unanimously carried.

Moved by the Chairman, and seconded by Mr. R. Hesketh Jones, dividends were declared at the rates per annum of 15 per cent. on the original shares, 7 per cent. on the "B" shares, and 6 per cent. on the preference shares, all less income-tax.

Proposed by Mr. F. H. Pilley, and seconded by Mr. J. C. Benwell, a hearty vote of thanks was passed to the Chairman and Directors.

The Chairman, having responded, moved a vote of thanks to the Engineer and General Manager, the Secretary, and their respective staffs. He spoke of the admirable manner in which the Company were served by all—from the highest to the lowest.

Mr. William Cash seconded the motion, which was cordially agreed to.

Mr. Harold Woodall and Mr. Plumb acknowledged the vote on behalf of themselves and their staffs.

CROYDON GAS COMPANY AND CO-PARTNERSHIP.

Annual Report of the Committee.

The Co-Partnership Committee of the Croydon Gas Company, of which the Chairman of the Company (Mr. Charles Hussey, J.P.) is the Chairman and the Engineer and General Manager (Mr. James W. Helps, M.Inst.C.E.) the Deputy-Chairman, have presented their report, with an abstract of the accounts, for the year ended the 30th of June. It shows that the bonus for the twelve months was at an average rate of 4 per cent.—*i.e.*, 3 per cent. for the first three months, then 4 per cent. for six months, and 5 per cent. for the remainder of the year. The Committee feel that the co-partners as well as the Company are to be congratulated on the favourable trading results which enabled reductions in the price of gas to be made from Michaelmas, 1910, and Lady Day, 1911. It is regarded as further ground for satisfaction that the results of the half year to June have enabled the Directors to announce a further reduction of 1d., to take effect from the 1st of October next, with the result that the bonus from that date will be at the rate of 6 per cent. The Trustees propose to transfer, as at the end of August, "D" stock (carrying dividend as from July 1, 1911) to co-partners, so far as the amounts to the credit of their respective accounts will admit, at £110 per £100, or £5 10s. for each £5, *plus* stamp duty.

The Committee note with satisfaction that since the establishment of co-partnership by the Company the amounts paid in by co-partners to the credit of their withdrawable accounts amount to £2645 10s. 3d., or more than 60 per cent. of the sum of £4373 5s. 2d. declared as bonus; and, further, that no co-partner has up to the present, while in the Company's service, withdrawn any sum placed to his credit as bonus. The Committee are glad to be able to state that arrangements, kindly sanctioned by the Directors, have been entered into with the Inland Revenue authorities wherby co-partners receiving wages or salaries not exceeding £2 12s. per week, or £135 per annum, can obtain through the Company, without any formalities, repayment of the amounts deducted as income-tax from their dividend warrants. The Committee emphasize the advantages (especially to the younger men) of the facilities for life insurance on specially favourable terms secured to the Company's employees by the arrangement that has recently been entered into with the Provident Clerks' and General Mutual Life Assurance Association.

In conclusion, the Committee again express the hope that each employee of the Company realizes the mutual advantages of the co-partnership scheme, and appreciates the fact that under it he is directly interested both in the economical working and in the development of the Company's business. They hope also that the co-partners realize the encouragement given, and the facilities now open to employees of the Company, for thrift and saving.

The accounts accompanying the report, which are signed by Mr. William W. Topley, the Secretary to the Company, who is the Secretary to the Committee and also one of the Trustees, show that the combined investment and withdrawable accounts from Jan 1, 1909, to June 30, 1911, stand as follows: Bonus, £4373; savings, £2646; interest, £187—total, £7206. Withdrawn, £859; invested, £1932; held by trustees for co-partners, £4415—total, £7206. The accounts are certified as correct by the Auditors (Messrs. A. L. Savage and F. F. Wood).

INAUGURATION OF THE LIVESEY MEMORIAL HALL.

Interesting Gathering at the South Suburban Gas-Works.

The Livesey Memorial Hall at the works of the South Suburban Gas Company, an illustrated description of which was given in the "JOURNAL" for the 8th inst. (p. 350), was crowded on Friday evening last by the co-partners in the Company and their friends.

Mr. CHARLES HUNT (the Chairman of the Company) presided; and on the platform were Sir Fortescue Flannery, Bart., M.P., Messrs. Aston, Jabez Light (Deputy-Chairman), Robert Morton, W. G. Waller, C. Ross, S. Y. Shoubridge (Engineer), Charles M. Ohren (Secretary), H. J. Heading, F. J. Jones, W. J. Luther, A. C. Baker, E. Peckham, C. J. Carter, E. S. Morris, and F. Watts.

Mr. CHARLES HUNT, in opening the proceedings, said it was a great disappointment that Mr. Morton was not well enough to occupy the chair, because he was one of Sir George Livesey's oldest friends. As all present were aware, they had met to honour the memory of Sir George Livesey, who would be remembered as the founder of the co-partnership system. He (the Chairman) also recollected that Sir George and Mr. Morton were pioneers in the abolition of Sunday labour in gas-works. In 1871, it was abolished at the Old Kent Road and at Nine Elms; and at the latter place he (the Chairman) was associated with Mr. Morton in the movement. Later on he had the satisfaction of introducing the system at Birmingham. They had hoped to have with them that evening Mr. Frank Livesey, a nephew of Sir George; but, unfortunately, he had met with a slight accident, and his doctor refused to allow him to go out. They were met to inaugurate the building in which they were assembled, in memory of the man whose name would long be a household word among gas workmen; and whose name and memory had penetrated even beyond the confines of the gas industry. It was peculiar that they should be meeting for such a purpose, in view of what was taking place all over the country. Whatever might be their opinions politically or otherwise, he was sure they would all agree that the intimidation that was being exercised outside should be met with stern repression. They all knew that the sick fund associated with the South Suburban Gas Company originated with Sir George Livesey; and it stood to-day as evidence that they could do better than the Government proposed by their National Insurance Bill. They had also their superannuation fund; and they knew what had been done, in connection with their co-partnership scheme, to reduce the number of accidents among them. But while Sir George Livesey was not unmindful of the duties they all had to perform, he also recognized that all work and no play made Jack a very dull boy; and in providing the Institute for the benefit of the employees, he (the Chairman) thought they were doing a work of which Sir George would have highly approved. In addition to the large hall in which they were assembled, there was a billiard-room and a library; and outside there was a tennis-ground and bowling-green. With regard to the library, they hoped first of all to make it a technical one; but it was not intended that it should be technical pure and simple. He found himself that the reading of a real novel was a relaxation and good for him; and he did not see that what was good for him could be bad for any of them.

Mr. JABEZ LIGHT, who followed, referred briefly to the memorial established at the Leeds University in memory of Sir George.

Mr. ROBERT MORTON said he was very pleased to be present as one of Sir George Livesey's oldest friends; and he regretted exceedingly that one of their Directors—Mr. Charles Carpenter—was unable to be with them. But he had a letter from Mr. Carpenter expressing his continued absolute belief in the merits of co-partnership.

Sir FORTESCUE FLANNERY, Bart., M.P., said in a few weeks' time there would be the third anniversary of the loss of a man whose passing away removed from the stage of life one of the greatest social reformers of this generation. To his mind, it was one of the most extraordinary combinations of circumstances that at this period, without any pre-arrangement, but entirely by accident, they should be assembled in such large numbers in contrast with what was happening outside—cities in darkness, anarchy, riot, and bloodshed in some of the largest towns in the North of England; industrial war, almost a revolution; class against class—a condition of things which called for the strong hand of repression in order to maintain law. They were assembled that evening, not merely to honour the memory of a great man, but to celebrate one stage in the progress of a movement which he had initiated, and to which they were all proud to belong—namely, co-partnership, without which he believed there would be no remedy for the state of things which was at present upheaving society in England from the top to the bottom. He had been much interested in reading some of the recent speeches of the chairmen of gas companies. Mr. Carpenter, whose absence they so much deplored, said to his shareholders: "I have to report to you that our relationship with our men in all departments and in all branches was never more satisfactory, never more harmonious, than it is at the present day." The Chairman of the Commercial Gas Company had said practically the same thing. Both of these were co-partnership Companies. On the other hand, Mr. Clynes, M.P., in a speech delivered to an assembly of gas workers recently in the North of England, said that "the position of the labourer in the workshop was a tragedy that would have to be remedied. If the labourer had any grievance, he was not listened to, and was treated little better than a brute beast. He did not altogether blame the foreman and the manager. They were the victims of the present system, and were engaged not only to buy labour, but to bully if necessary." This was a description given by a man who was supposed to know, from one point of view at all events, about the condition of labour in the gas trade. Which was the true and right view? Who would say that labour was bought and bullied in any co-partnership system? These words, reprehensible as they were, indicated the great desire that was being manifested by the workers in this country for more equality, and a more reasonable share in the good things produced by labour. There were two courses open to those who guided the destinies of the people of Great Britain. One was to allow of the continuance of the feeling of unrest and dissatisfaction; and the other was to adopt throughout the whole industrial system, with such modifications as might be necessary to suit each individual case, the system of co-partnership, so that every man who laboured should feel that he had a share, not only in the daily reward, but in the ultimate result of the whole of the operations in which he was concerned. This was a large ambition, and it might be that none of those present would live to see it fulfilled; but that it would ultimately come to pass he had no doubt. They were met together, not only to celebrate the great movement of which Sir George Livesey was the originator and pioneer, but to express the love and esteem they felt for the man himself. The hall reflected great credit on Mr. Shoubridge, the architect, and the builders; and it would ever serve to keep alive the memory of one whose name would be cherished, alike by those who knew him and those who had benefited by his labours, with feelings of imperishable gratitude.

Mr. E. S. MORRIS said he deemed it a privilege and an honour to be associated in the management of the South Suburban Gas Company, not so much on account of its success and importance, but chiefly because they were the pioneers in a great field of industrial economics and social reform. It was gratifying to know that the cause of co-partnership continued to make such a steady advance as to justify them in the continued hope that the day would ultimately arrive when organized industry as a whole might adopt some form of co-partnership, and when industrial warfare, such as that now taking place throughout the country, would be impossible. Year by year the example set by the South Suburban Gas Company was being followed by ever-increasing numbers. They did not need to be reminded of the advantages of a system under which capital and labour each received its due reward, and the working man ceased to be a mere wage-earner, and became a partner in a great democratic organization, sharing in the success of the undertaking. Mr. Henry Vivian, the Labour Member for Birkenhead, said, with reference to co-partnership, that it infused into the employee the spirit of hopefulness, workshop patriotism, and that wider interest in life which sprang from an individual feeling that he was a conscious contributor to a great and creditable achievement such as the organization of a large and successful business enterprise. On the occasion of the last annual meeting of the Labour Co-Partnership Association, Mr. Corbet Woodall, in the course of his Presidential Address, conveyed the same idea. He (Mr. Morris) was quite sure that the spirit to which Mr. Vivian referred was infused in every man in the hall. There was no room for class differences in their ranks; their interests were the same, and the goal of their undivided aim was the well-being of the Company as a whole—employer and employed alike. It was because of this unanimity of purpose and solidarity of effort that he ventured with confidence to prophesy the continued success and prosperity of the South Suburban Gas Company. He was convinced that they would regard the hall as a sacred trust, never forgetting that bricks and mortar, and even pictures and busts, were but symbols and tokens, and that the only true memorial to their leader and teacher must still be sought in their lives and the uses they put them to.

Mr. W. G. WALLER, on behalf of the employees, wished to thank the Board for the gift of the magnificent hall, which he said was another instance of the great interest the Board took in the well-being of the employees, and would strengthen that feeling of unity and brotherhood which had been the characteristic of the Company for many years past. The hall would serve to remind them, and those who would follow them, of the untiring goodness of the late Sir George Livesey to the gas industry of the country.

Mr. C. ROSS also briefly thanked the Board.

Mr. F. J. JONES supplied some interesting statistics from the co-partnership books of the Company. He said the bonus on the 31st of January last, at the rate of 6½ per cent., amounted to £3539. The total amount of bonus paid from the commencement in 1894 to 1911 inclusive was £20,453; and the amount of stock held by 503 co-partners represented £23,628. In addition to this, they had on deposit with the Company £514 on withdrawal account, and £274 on trust account—a total of £788. There were 15 co-partners who had purchased or were purchasing houses through the building society.

Mr. W. J. LUTHER proposed a vote of thanks to the Chairman and Board of Directors.

Mr. COLE, in seconding the motion, said the hall would stand as a monument to the generosity of the Board, and would keep fresh in their minds the name of the founder of the policy of co-partnership.

The motion having been carried by acclamation,

The CHAIRMAN, in returning thanks, said he hoped all the employees would make full use of the hall. Sir George Livesey frequently in his addresses referred to the scriptural injunction: "Do unto others as you would they should do unto you;" and he thought it would be a good thing to display this motto in some conspicuous place in the hall.

This closed the business; and the remainder of the evening was devoted to music.

Taking Water from Hydrants.—On Monday last week, James Hampton, a traction-engine driver, was fined 5s. and 14s. costs by the Croydon County Justices for taking water from a street hydrant. The defendant had used a spanner to turn on the water, which he wanted for his boiler. It was explained that the use of spanners wore off the corners of the stopcock, and the real danger was that if a fire occurred the proper appliances might slip, and result in considerable delay in getting water.

Elsecar, Wentworth, and Hoyland Gas Company.—The accounts presented at the recent annual general meeting of this Company showed that the revenue in the twelve months ended June 30 last amounted to £6096, and the expenditure to £4701; leaving a balance of £1395 to go to the profit and loss account. The amount available for distribution was £2740; and a dividend of 10 per cent. was declared, less income-tax. Under the supervision of the Manager (Mr. William Stenton), the quantity of gas manufactured during the twelve months was 35,754,200 cubic feet, against 35,101,700 cubic feet the previous year—an increase of 652,500 cubic feet. The sale of gas went up 1,193,900 cubic feet. There was a decrease of 158,300 cubic feet through ordinary meters; but the prepayment meters showed an increase of 1,340,300 cubic feet, and the public lamps of 11,900 cubic feet. The plant and works were maintained out of revenue.

The following illustrations show the

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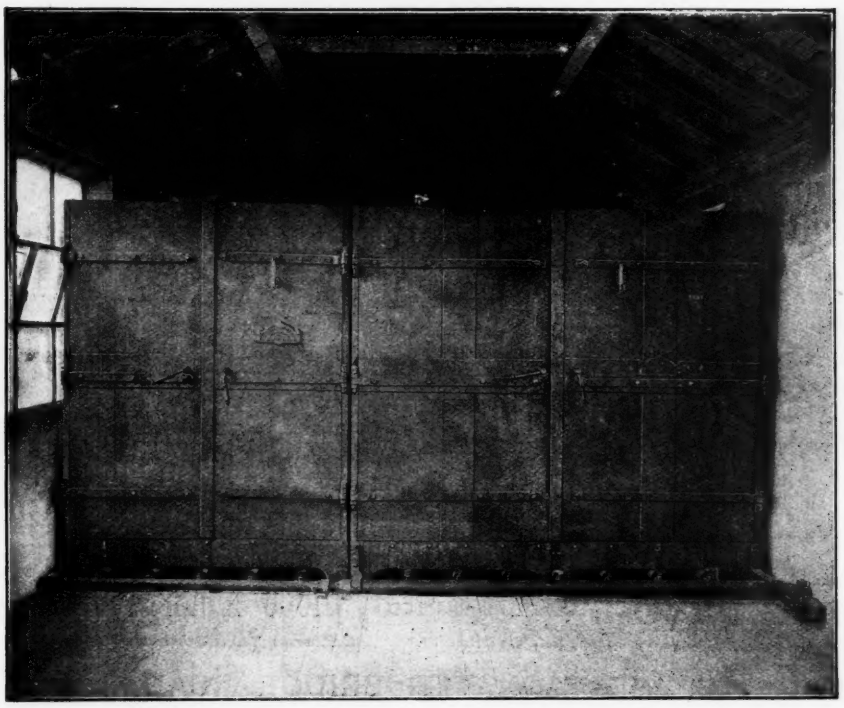
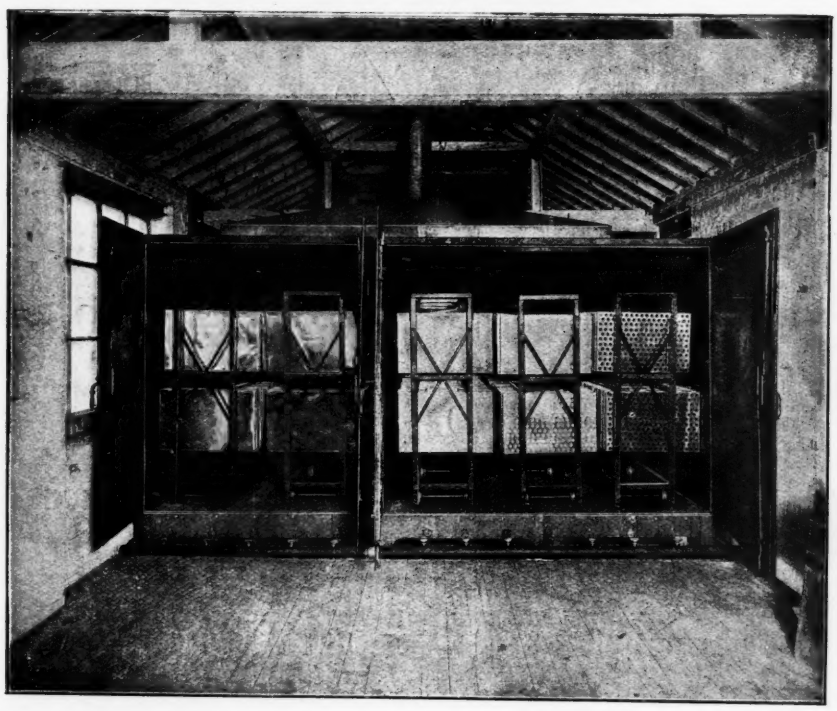


GAS AS A FUEL FOR INDUSTRIAL PURPOSES.



The above oven is one of the largest ever made, being 13 ft. 6 in. wide, by 13 ft. 6 in back to front, by 6 ft. 6 in. high, inside measurements.

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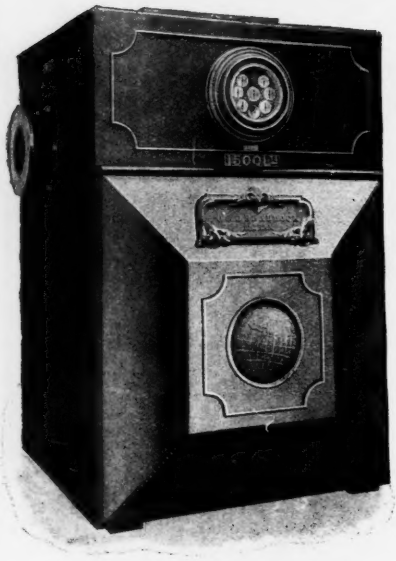

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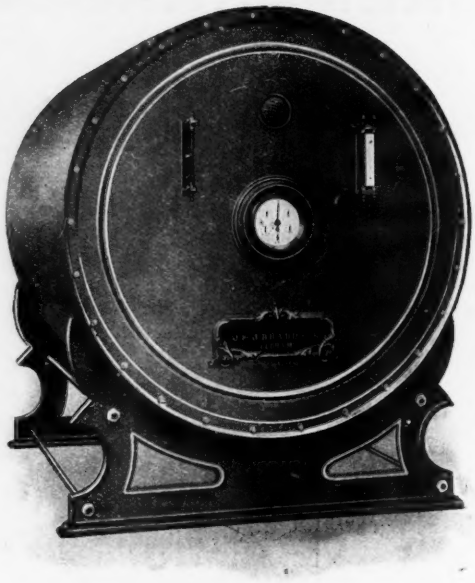

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BECKTON GAS WORKERS.

[From a LOCAL CORRESPONDENT.]

In the midst of the widespread agitation in the industrial world, statements have been published that the men employed at the Beckton works of the Gaslight and Coke Company had also become restive. The foundation for these statements is very slender. During the past week, some of the men in the carbonizing department have held meetings among themselves of a more or less informal character, the end of which was that an application was made for an increase of pay at the rate of 1s. per shift over and above the prices now ruling.

The request was put before the Manager of the works (Mr. J. N. Reeson); and it was arranged that on Sunday morning he should meet the men. As appointed, Mr. Reeson had an interview with the men inside the works; and it is understood that he then informed them that, at the present time, a number of the Directors were away, and nothing could be done; but, when they returned, the facts would be put before them for their consideration.

With such a number of men as are employed at Beckton, the effects of the recent trouble among the men close at hand in the docks and on the wharves were almost certain to drift among them. But there is no cause for alarm. True, a member of the local Council is reported to have said, during the late labour troubles, that they would "have the Beckton men out;" but there are no signs which would indicate that the men are prepared to take this drastic course.

In considering the present position, there are certain important factors which cannot be ignored. Most of the permanent men in the employ of the Company come within the ambit of the co-partnership scheme—a scheme which has been loudly condemned by the local Trade Union officials; and it is inconceivable that the men would strike, and thus surrender their partnership unless they had very good grounds for so doing. Up to the present at any rate, there has been no public agitation which would warrant this assumption. On the other hand, there is now a great deal of what may be called casual labour at Beckton. The men do their day's work, and are paid off; and although their employment may be practically permanent, they are none the less placed on quite a different footing from the men who are permanent servants of the Company. These men are not at all well organized—indeed, not 50 per cent. of them are members of the Gas Workers' Union. Whatever may happen later on, the operation of the co-partnership system and the lack of organization among the gas workers are facts which cannot be gainsaid or overlooked in a review of the situation.

On Sunday morning a public meeting was arranged by the Gas Workers' Union on the piece of vacant land opposite the Central Park, East Ham. The chair was taken by Mr. W. Ryall, the Secretary of the East Ham branch of the Union, and the speakers included Councillor Oakes, J.P., the Deputy Mayor of East Ham, and Mr. W. Lock, of Lambeth, a member of the District Committee. The meeting was unusually well attended—about 1000 men being present.

The CHAIRMAN said the Union had convened the meeting, because they wanted all the Beckton men to come within their ranks; and he made an appeal to them to do so. He had arranged the meeting because he had heard that the men were prepared to come back to the organization which they were responsible for founding. Was it not time that the men should join the organization which "protected" them? He understood that the men at Beckton had that morning held a meeting in "Blackleg Square." Why was it that the men had called the meeting? It indicated that they were dissatisfied.

Mr. W. LOCK spoke of the great industrial upheavals which had taken place recently in the industrial world. In the past, the Gas Workers' Union had obtained better pay for the men, in the eight hours' day, than they previously had when they worked ten hours a day. When the men were properly organized, there would be no blacklegs. Though a long way from being properly organized, they would never stop till they had brought that about.

Councillor OAKES, J.P. (a member of the East Ham Bench of Magistrates, a borough in which the Beckton Gas-Works are situate), said it was time that all of them realized the value of trade unionism. Twenty-two years ago it was thought necessary; and it seemed strange that they should have to argue now that it was necessary for men to organize in order to protect their own interest. However, it appeared that it had to be done again; and he hoped that in the new movement things would be done better than had been done in the past. The men in Beckton secured years ago an eight-hour day and certain other improvements; and had they continued members of the organization, the same conditions would have remained that day, and would have been improved upon. If the men joined the organization, they would gain all they were justly entitled to.

The CHAIRMAN said he had just received the information that after all the trouble of going to "Blackleg Square" and interviewing Mr. Reeson, they had come back without anything being decided. What were the men asking for? All they asked for was an extra shilling a day all round. He could assure them that if the men would stick to the Union, the Union would stand by them. He appealed to the Beckton men, because this meeting had been called specially for them. He asked them to once again become members of the Gas Workers' Union; and although much had been done in 1889, more could be done in 1911. The meeting was a great encouragement; for it was the largest they had had for several years.

Swinton and Mexborough Gas-Works Purchase.—At a meeting of the Joint Gas Board of the Swinton and Mexborough District Councils last Wednesday, Alderman J. H. Watson referred to the award of the Umpire in the arbitration proceedings in connection with the acquisition of the undertaking of the Gas Company, as given in the "JOURNAL" last week (p. 433). He said the award had been made soon enough to enable the Board to take over the concern by the 30th of September, and to come into possession for the last quarter of the year. He defended the action of the two Councils in acquiring the undertaking, and said he was convinced that it would be in proper hands and a benefit to the people.

A PUBLIC LIGHTING CONTRACT AT NORTHALLERTON.

Ignoring Suggestions by the Gas Company—A Contract for Electricity Not in Accordance with the Invitation for Tenders.

The Northallerton District Council have just entered into a new contract with the Electricity Company; and a comment on their methods of procedure appears in another part of this issue of the "JOURNAL." In the matter of this new contract, the Council seem to have studiously given the go-by to the Gas Company, both in the terms of their invitation to tender, and in ignoring altogether a communication the Company made to them on the subject. Notwithstanding this communication, the Company heard nothing more from the Council—the only intimation that a new contract (and that for five years instead of two, according to the terms of the invitation) had been entered into being through the channel of the local newspapers. The story is a very interesting one. It opens with the following letter from the Clerk to the District Council:

July 5, 1911.

The Secretary, Gas Company, Northallerton.

Dear Sir,—This Council will be pleased to receive tenders for the town lighting as follows:

(1) For the whole of the town.
(2) For the main street and South Parade.
(3) For the side and back streets.

Sealed tenders, marked "Tender for Lighting," to be sent to me on or before the 15th inst. The Council wish you to quote a price per 100 hours for 16, 32, and 800 candle power.

The Company to provide all plant, and comply with the directions of the Council as to the times of lighting. The Company to light and put out all lamps.

You will, of course, understand that the Council may accept your tender for either No. 2 or No. 3, and not for the other. The contract will be for two years.

(Signed) W. FOWLE.

Referring to this invitation, the Secretary of the Gas Company (Mr. Thomas Harrison), acting upon the instructions of his Board, forwarded the following letter to the District Council:

July 14, 1911.

Gentlemen,—In reply to yours of 5th inst., asking for tenders for the town lighting with 800, 32, and 16 candle power light, we beg respectfully to point out that 800-candle power lights are not suitable for gas lighting, but that a much more satisfactory result can be obtained by distributing the light over the same area—that is, by having a greater number of lights of (say) 100 or 200 candle power per lamp.

We suggested two years ago that your Council would allot a portion of the town, and this Company would provide and fix the latest form of incandescent lamps, for comparison of cost and light. We feel sure that this arrangement would give most satisfaction to you.

We need not remind you that this Company are large ratepayers, and claim your consideration in dealing with this matter. THOS. HARRISON.

No notice whatever was taken of this communication; and the next that was heard of the matter was after the publication of the following proceedings at a recent meeting of the Council.

Mr. HAMILTON presented the General Committee's minutes for adoption, and stated that the Committee only received one tender for the lighting of the town. It had been decided to adopt the tender from the Electric Light Company for each arc lamp burning 100 hours, 13s.; for each 32-candle power lamp per 100 hours in the main street, 3s.; for each 32-candle power lamp per 100 hours in a side street, 3s. 9d.; for each 16-candle power lamp per 100 hours in any street, 2s. 6d.

The CHAIRMAN (Mr. H. Clidero) stated that a further letter had been received from the Company, to the effect that during the last year of the present contract the whole of the 32-candle incandescent lamps had been replaced by others equal to 45-candle power; thus improving the general illumination of the town and at no extra cost to the Council. If the Company were again favoured with the contract, these lights would be continued. If the Council were prepared to enter into a contract for five years, the Directors would allow a discount of 5 per cent. off the quarterly accounts. Taking the payments for the last five years, this would be a saving of £100, or £20 per annum.

Mr. HAMILTON said it was only after deep consideration that the Committee asked the Council to adopt the contract for five years. It would be a matter of saving £100 in five years. It seemed rather a big step; but it would be a considerable saving to the town. In any case, it would pay the Council to accept the tender for two years, and with the discount for five years.

Mr. JAMESON said it was not possible for the Gas Company to tender under the specifications sent out. In all probability they would have had to instal different plant; and if they had known a tender would have been accepted for five years, they might have submitted one. He did not think the tender for five years should be adopted, even if the rebate were given, as he thought it wrong to tie the hands of members who might come into the Council in future. He moved an amendment that the minutes be confirmed, with the exception that the tender be accepted for two years instead of five years.

Mr. EATON inquired if the specifications for tendering were the same as before, which included one for the main street and another for the side streets. While admitting that the main street was well lighted, many people who lived on the outskirts of the town had good reason to complain of the lighting of the side streets. If the Gas Company had tendered for the side streets, they would have offered to put up incandescent burners, and these streets would be better lighted than they were at the present time.

Mr. HAMILTON, in reply to the question, said the tenders were the same as hitherto.

Mr. WALKER inquired if the tenders had to be sent to the Chairman sealed, and if he had received any.

The CHAIRMAN replied that he had not received any tender. Mr. Fowle spoke to Mr. Hamilton about the tender being left to the Council; but Mr. Hamilton had pointed out that the Committee always dealt with them.

Mr. WALKER asked for the reading of the minute on this.

The CLERK read it; but no mention was made about tenders having to be sent to the Chairman, and opened only in the full Council.

Mr. WALKER said he saw one specification sent out which stated that sealed tenders had to be sent to the Chairman of the Council. If the matter were left over until next month, he could produce the specification which was sent to the Gas Company.

Mr. EATON said he never knew a gas company to quote for 800-candle power. Did anyone else?

Mr. HAMILTON said that when the lighting question was under consideration, 1000-candle lights were mentioned; but, in order that the Gas Company might tender, this was reduced to 800-candle power, and they had tendered for this light.

Mr. JAMESON said the light was not 800-candle power, but was marked 350-candle power, as Mr. Hamilton could discover.

Mr. HAMILTON replied that he was not interested in either Company, but wanted the best lighting for the town.

Mr. WALKER pursued his point about the specification to the Gas Company being different from others, and asked on whose authority the tenders were sent out.

Mr. HAMILTON replied that it was on the authority of the Council. At the last meeting he said the tenders were on the table, if members wished to examine them; and if they did not do so, it was not his fault. The present was not the time to dispute them.

Mr. WOODHEAD remarked that by adopting the tender for five years they would save £100, which amounted to almost ¼d. rate on the year.

Mr. EATON said it was hardly fair to accept a tender for five years when firms were only asked to tender for two.

The CHAIRMAN then put the motion that the tender be for five years, and five voted for and five against it. He then gave his casting vote for the motion.

LEYDEN MUNICIPAL GAS UNDERTAKING.

Report for the Year 1910.

The following particulars of the working of the Leyden Municipal gas undertaking for the year 1910 are abstracted from the full report of the Leyden Municipal Gas and Electricity Works for the year, for a copy of which we are indebted to Heer N. W. van Doesburgh, the Manager of the undertakings.

The constitution of the Leyden Corporation Gas and Electricity Committee is unchanged. The Committee decided last November to increase the wages of all weekly employees by 50 cents. (10d.) The purchase of land for the extension of the works, referred to in the previous year's report [see "JOURNAL," Vol. CXI., p. 346], was completed. The gas supply of a number of suburbs, mostly by means of high-pressure mains, was undertaken in the course of the year. A contract was made, in conjunction with the Municipal Gas-Works at The Hague, for the supply of 21,000 tons of Westphalian and 4000 tons of English gas coal; and agreements were also made for the sale of the year's production of coal-gas tar and water-gas tar to Paris and Rotterdam firms. The capital expenditure of 771,140 florins (£64,262) is being incurred for extensions of the gas-works and coke plant. The accounts of the gas undertaking show a gross profit for the year of 109,637·52 florins (£9136), and, after paying interest and redemption charges, a net profit of 43,196·22 florins (£3600). The profit is rather lower than in the preceding year.

The carbonizing plant consists at the present time of nineteen beds, each of eight retorts. Some of the settings and portions of the carburetted water-gas plant have been renewed during the year. The new plant for the manufacture of sulphate of ammonia was brought into use on Jan. 15, and the old plant for the concentration of liquor was done away with. On Jan. 27, a fire broke out in the coke-store; but it was soon isolated, and only 12,265 bushels of poor coke were consumed. On March 17, it was discovered that the coal in the large store was overheated. A portion of it was at once carbonized, and the rest removed. A new store was erected during the year, with an electric lift. At the pumping-station, a twin governor was installed in connection with the gas supply to suburbs. In the suburbs of Leiderdorp and Warmond, gasholders of 17,658 cubic feet capacity each were erected; and in the suburb of Rijnsburg, one of 28,253 cubic feet capacity was erected in connection with the arrangements for the supply of gas to these districts. A supply of meters and apparatus for use in these suburbs was also purchased. This work necessitated the laying of a number of new mains in connection with the distributing system. The total length of main now is 48½ miles. The average pressure of the gas supply in the centre of the town was 15·4-10ths of an inch.

The coal carbonized in the course of the year amounted to 25,661 metric tons. The average make of gas was 10,833 cubic feet per English ton of coal. The total make of gas was 348,230,134 cubic feet, of which 21·43 per cent. was carburetted water gas and the remainder coal gas. This make shows an increase of 2·97 per cent. on that for 1909. There were used in the production of 1000 cubic feet of carburetted water gas 20·78 lbs. of oil, and 49·7 lbs. of coke. The largest make of gas in a day was 1,456,114 cubic feet, and the smallest 453,811 cubic feet. The gross calorific power of the gas made was 593 B.Th.U. per cubic foot. The gas contained 22·3 grains of sulphur per 100 cubic feet. The unaccounted-for gas amounted to 4·33 per cent., as compared with 3·55 per cent. in the previous year. About 64 per cent. of the total make of gas was sold through ordinary meters at the price of 2s. 7d. per 1000 cubic feet; and 18·66 per cent. through prepayment meters, with which the price was 3s. 1d. per 1000 cubic feet. The receipts from the sale of coke were less than in the preceding year; but the receipts from ammonia and tar were greater.

All over the country the effects of the late long-continued drought are being felt, and measures have been resorted to in order to conserve as long as possible the stores of water. The inhabitants of the Metropolis have the satisfaction of learning that the Water Board have in the reservoirs controlled by them about 7000 million gallons of water; so that there need not have been any fear of a curtailment of the supply even if the drought had continued for some time longer.

BURNLEY CORPORATION GAS UNDERTAKING.

Annual Report of the Engineer.

The Gas Engineer of the Burnley Corporation (Mr. J. P. Leather) has presented to the Gas Committee his report for the year ended the 31st of March. It furnishes the following particulars.

There was an increase of 62,606,000 cubic feet, or 9·04 per cent., in the make of gas compared with the preceding year, when the increase was 3·04 per cent. The total make was 755,184,000 cubic feet, apportioned as follows: Sold, 647,864,468 cubic feet; consumed in the public lamps, 52,756,000 cubic feet; used on the works, 7,921,100 cubic feet; unaccounted for, 46,642,432 cubic feet (6·17 per cent. on the make). There are now 2834 public lamps in the borough, or 59 more than at the close of the year 1909-10. The amount receivable for gas sold by meter (less discounts, allowances, and irrecoverables) was £74,546. Out of the 755,184,000 cubic feet of gas made, 248,865,000 cubic feet, or 32·9 per cent., was oil gas. In the production of coal gas, 46,349 tons of coal were carbonized. This works out to 10,904 cubic feet per ton, compared with 10,339 cubic feet before. For making the oil gas, 633,504 gallons of oil were used, or 2·54 gallons per 1000 cubic feet, against 2·67 gallons before. The average illuminating power of the gas supplied was 18·36 candles; and the sulphur average was 7·66 grains per 100 cubic feet. The figures for the preceding year were 17·67 candles and 11·85 grains.

There was a decrease of 78 in the number of ordinary meters in use, and an increase of 515 in the prepayment meters. The total number of meters in use now is 26,840, of which 13,904, or 51·8 per cent., are of the prepayment class. The amount of money collected from the prepayment meters was £26,359 15s. 2d., which corresponds to 200,292,668 cubic feet of gas. The average number of these meters in use at one time was about 13,640; the average annual consumption of gas per meter, therefore, was 14,680 cubic feet. In 1909-10, the average was only 14,200 cubic feet. There are now 10,997 small breakfast cookers in use with prepayment meters. The business done in the gas-stove department during the year was as follows: 114 cookers and 75 gas-fires were sold direct, and 468 cookers and 6 gas-fires were fixed on the hire-purchase system. The number of cookers on simple hire is 24 less, and of gas-fires 5 less, than reported last year.

Mr. Leather gives the following table showing the total amount of business done since the Gas Committee commenced to let stoves on hire:—

	Cooking-Stoves.	Gas-Fires.	Total.
Sold direct since May, 1883	2,041	1978	4,019
Sold on hire-purchase (purchase completed)	5,872	427	6,299
Do. (purchase not completed)	2,050	113	2,163
Now on hire	306	147	453
Total	10,269	2665	12,934

The total length of mains laid in the twelve months covered by the report was 5176 yards, and 720 yards were taken up; making a net increase of 4456 yards. There were 497 services laid to new property during the year.

GAS-WORKS EXTENSIONS AT RISCA.

Local Government Board Inquiry.

At the Offices of the Risca Urban District Council last Wednesday, an inquiry was held by Mr. P. M. CROSTHWAITE, M.Inst.C.E., into an application made by the Council to the Local Government Board for authority to borrow £20,000 for the construction of gas-works and extensions of plant.

Mr. F. J. WALMSLEY, the Deputy-Clerk to the Council, explained that the area of the district was 4195 acres. The population in 1901 was 9661, and at the present time 14,149; and the assessable value was £45,637. The outstanding loans were £28,009 under the Sanitary Act, £47,250 under the Gas-Works Act, and £34,750 under the Gas and Water Act.

Mr. *G. S. Davies*, the Gas Manager, said the existing arrangements were insufficient, particularly as the Council had to supply part of another district. The make of gas last year was 23,537,000 cubic feet, and the consumption 18,000,000 cubic feet. The maximum day's output was 104,000 cubic feet; and the gasholder capacity was 7000 cubic feet. The carbonizing plant was just equal to the demand; but they had no stand-by plant. They could turn out 104,000 cubic feet a day continuously, and without inconvenience. They proposed to put in seven new retorts without furnaces. At present they had 24. They would provide two purifiers, which would increase their purifying plant 80 per cent., and two condensers, which would increase this portion of the plant by 60 to 80 per cent. They would put in a new governor, and erect a new gasholder with a capacity of 120,000 cubic feet—an increase of more than 100 per cent. They were also going to instal sulphate of ammonia and gas-compressing plant, erect a governor-house, a retort-house, and a shed for the sulphate plant, together with the necessary stores and offices, and lay a steel main and subsidiary main.

Mr. TREVOR C. GRIFFITHS, Clerk to the Mynyddislwyn District Council, said there were a great many details which would have to be settled. The district for which they were making provision was a part of Monmouthshire that was growing at an enormous rate; and the arrangements would have to be made accordingly. A great quantity of the pipes would be laid in the district over which his Council had control. The Bedwellty Council proposed buying the Blackwood Gas-Works, and as it would not be good policy for the Council to be distributing in Mynyddislwyn, the Council of the latter place were considering the question of buying a portion of these works. The Risca mains, &c., might be purchased by his Council, as well, later on; so they had a right to see that the mains put down were of sufficient dimensions to serve an estimated population for a considerable time to come.

This closed the inquiry.

SKEGNESS DISTRICT COUNCIL AND THE GAS-WORKS.

Proposed Purchase.

At the Monthly Meeting of the Skegness Urban District Council last Tuesday, the Chairman (Mr. Shelley) moved that a Committee of all the members of the Council be appointed to meet in October to consider the advisability of acquiring the gas-works for the benefit of the town. The Local Authority, he said, made a great mistake in 1902 in not obtaining a purchase clause when the Skegness Gas Company applied for a Provisional Order. There should be no monopoly in commodities that were essential for the welfare of the people. He believed the Company was a sound and profitable undertaking, and in his opinion it would be better for it to be in the hands of the town. The increase in the quantity of gas consumed last year was no less than a million cubic feet compared with the previous year. There was a long list of towns which were relieving the rates to a considerable extent by having control of the gas supply. Mr. Ball seconded the motion. Mr. Canning moved, as an amendment, that before the Committee met the Clerk should write to the Company asking if they were willing to sell, and, if so, to state their price. He said that as a Council they were mortgaged as high as they ought to be; but there could be no harm in acquiring a profitable undertaking. The resolution, as amended, was carried unanimously.

MUNICIPAL EMPLOYEES AND NON-UNIONISTS.

A Vigorous Protest against Coercion.

The leaders of the Municipal Employees' Association in Lancashire are engaged in an active campaign which aims at compelling committees of corporations to employ only Trade Union labour in the different departments. At the Albion Hotel, Manchester, a meeting was held last Wednesday night of representatives from Manchester, Salford, Bury, Heywood, Stalybridge, Middleton, Ashton-under-Lyne, Oldham, and other towns, to consider the matter. After reports had been presented from the different places represented, it was resolved to confirm the resolution passed by the Manchester and Salford Municipal employees, that no member of the Association should continue to work with a non-unionist after the 31st inst., due notice to be given to the authorities concerned.

Sir Bosdin T. Leech, the Chairman of the Water Committee of the Manchester Corporation, dealing with the subject, says: "Combination for self-defence and self-protection is commendable; but as every virtue carried to excess becomes a vice, so combination in the shape of tyranny, exercised to destroy the liberty of the subject and to take the bread out of the mouths of industrious working people, is both hateful and iniquitous. . . . Toleration is met by tyranny. The Council in the past have not penalized combinations or Trade Unions. The service has been open to all. They have adopted Standing Orders that ensure fair wages being paid in all contracts, and they have agreed that 25s. per week shall be the minimum wage. As a rule, Corporation servants have higher wages and shorter hours than private firms, besides which they have secure situations. An attempt to dictate who shall be employed is now on the carpet. The Council are to be degraded and told by outside agitators whom they shall employ. Old and independent employees must bow to the caprice of Trade Unionists or be ruined." Sir Bosdin adds that he will be surprised if the Council do not resent the proposed dictation and let it be known that they will protect those who desire to remain outside the Trade Union, and, further, that they will discharge anyone who interferes with the liberty of his fellow-workman. He points out that gangers with 25s. and 30s. per week, if driven into the Trade Union, will be in the difficult position of having to serve their paymasters, the Corporation, and also the Trade Union officials to whom the men will appeal. He says there is no objection to Trade Unionists asking their brethren to join them; but he submits that they have no right to use the argument of force.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The decision of Lord Ormidale in the action relating to the allotment of shares in the Cowdenbeath Gas Company, given in the "Legal Intelligence" column, is not satisfactory reading, in respect of its prolixity upon the evidence and its apparent leaving out of account altogether the circumstance that there was an agreement between the parties, and an agreement which was not as originally framed, but which was amended by the parties after the adventure had run a considerable course. The Judge had already [see "JOURNAL," Vol. CXII., p. 729] decided that, under the agreements, the possibility of new shares being offered to the pursuers was in the contemplation of the parties. But this decision was brought under review of the Second Division, who, while approving of Lord Ormidale taking a proof in the case, were of opinion that it was not necessary to decide finally any of the questions raised [see "JOURNAL," Vol. CXIII., p. 613]. The case was manifestly sent back to Lord Ormidale to ascertain the facts, and to apply his mind to the facts, keeping the agreements in view. As I read the judgment just issued, Lord Ormidale assumes that his interpretation of the agreements when he gave his previous decision was acquiesced in, and that he did not require to give further consideration to these documents. I do not say he is wrong in such an assumption; but it would have been more satisfactory, to my mind, if he had brought out clearly how far the agreements were or were not respected in what was done. I am not familiar with the agreements, and so cannot say how the case would be affected by taking them into consideration; but, as the decision has been given, it appears to me that it does not exhaust the matter. The agreements appear to lie at the foundation of the case—in fact, I incline to the opinion that, had there been less of the formal and legal agreement, and more of the commercial transaction as between man and man, the likelihood is that there would have been no necessity for the unfortunate litigation which has arisen.

Bailie Taylor, the Convener of the Gas Committee of the Greenock Corporation, speaking on the gas accounts for the year, stated that they showed a balance of £6330; and that it was recommended that the price of gas be reduced to ordinary consumers by 2d., making it 2s. 7d. per 1000 cubic feet, and for power purposes by 3d., making it 2s. 3d. The price would be 1d. lower than it had ever been. The quantity of gas manufactured was the largest on record. Bailie Taylor spoke very highly of the labour and skill of the Manager—Mr. J. M'Leod. He moved the adoption of the rates proposed, and that the Gas

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 475.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,551,868	Stk.	Apl. 12	5	Alliance & Dublin Ord.	82—85	..	5 17 8
374,000	Stk.	July 14	4	Do. 4 p.c. Deb.	93—95	..	4 4 3
250,000	5	May 12	7	Bombay, Ltd.	6¼—6⅞	..	5 3 8
50,000	10	Feb. 24	15	Bourne- } 10 p.c.	29—30	+½	5 0 0
311,810	10	,,	7	mouth Gas } B 7 p.c.	16½—17	+⅛	4 2 4
75,000	10	,,	6	and Water } Pref. 6 p.c.	14½—15	..	4 0 0
380,000	Stk.	Aug. 16	13	Brentford Consolidated	256—261*	+2½	4 19 7
330,000	,,	,,	10	Do. New	198—203*	..	4 18 6
50,000	,,	,,	5	Do. 5 p.c. Pref.	120—122*	+½	4 2 0
206,250	,,	June 15	4	Do. 4 p.c. Deb.	97—99	..	4 0 10
220,000	Stk.	Mar. 10	11	Brighton & Hove Orig.	217—220	..	5 0 0
246,320	,,	,,	8	Do. A Ord. Stk.	157—160	..	5 0 0
490,000	20	Apl. 12	11⅝	British	44½—45½	..	5 3 5
120,000	Stk.	June 30	4	Do. 4 p.c. Deb. Stk.	94—96	..	4 3 4
109,000	,,	Aug. 16	6	Bromley, A 5 p.c.	113—115*	..	5 4 4
165,700	,,	,,	4½	Do. B 3½ p.c.	85—87*	..	5 3 6
82,278	,,	,,	5⅝	Do. C 5 p.c.	103—105*	..	5 4 9
55,000	,,	June 30	3½	Do. 3½ p.c. Deb.	82—84	..	4 3 4
250,000	Stk.	,,	4	Buenos Ayres 4 p.c. Deb.	95—97	..	4 2 6
100,000	10	—	—	Cape Town & Dis., Ltd.	2—3	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	4—5	..	—
100,000	Stk.	June 30	4½	Do. 4½ p.c. Deb. Stk.	80—83	..	5 8 5
157,150	Stk.	Aug. 16	5	Chester 5 p.c. Ord.	107—109*	+½	4 11 9
1,513,280	Stk.	,,	5/9/4	Commercial 4 p.c. Stk.	111½—113½*	+¼	4 16 1
560,000	,,	,,	5¼	Do. 3½ p.c. do.	105½—107½*	..	4 19 3
475,000	,,	June 15	3	Do. 3 p.c. Deb. Stk.	76—78	+½	3 16 11
800,000	Stk.	May 31	4	Continental Union, Ltd.	89—92	−1	4 7 0
200,000	,,	,,	7	Do. 7 p.c. Pref.	135—137	..	5 2 2
492,270	Stk.	—	5⅛	Derby Con. Stk.	122—124	..	4 8 9
55,000	,,	—	4	Do. Deb. Stk.	104—105	..	3 16 2
840,150	10	July 28	10	European, Ltd.	18½—19½	..	5 2 7
16,160,600	Stk.	Aug. 16	4/14/8	Gas- } 4 p.c. Ord.	105½—106½*	+⅜	4 8 8
2,600,000	,,	,,	3½	light } 3½ p.c. max.	83—85*	..	4 2 4
4,062,235	,,	,,	4	and } 4 p.c. Con. Pref.	101—103*	..	3 17 8
4,531,705	,,	June 15	3	Coke } 3 p.c. Con. Deb.	78½—80½	..	3 14 6
258,740	Stk.	Mar. 10	5	Hastings & St. L. 3½ p.c.	95—97	..	5 3 1
82,500	,,	,,	6½	Do. do. 5 p.c.	—	..	—
70,000	10	Apl. 27	11	Hongkong & China, Ltd.	17½—18	..	6 2 2
131,000	Stk.	Mar. 10	7⅜	Ilford A and C	147—150	..	4 18 4
65,780	,,	,,	5⅝	Do. B	119—122	..	4 16 3
65,500	,,	June 30	4	Do. 4 p.c. Deb.	94—96	..	4 3 4
200,242	Stk.	Mar. 10	6	Lea Bridge Ord. 5 p.c.	120—122	..	4 18 4

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
4,940,000	Stk.	May 12	9	Imperial Continental	180—183	..	4 18 4
1,235,000	Stk.	Aug. 16	3½	Do. 3½ p.c. Deb. Red.	90—92*	..	3 16 1
561,000	Stk.	Aug. 16	10	Liverpool United A.	210—212*	..	4 14 4
718,100	,,	,,	7	Do. B.	160—162*	..	4 6 5
306,083	,,	June 30	4	Do. Deb. Stk.	102—104	..	3 16 11
75,000	5	June 15	6	Malta & Mediterranean	4⅜—4¾	..	6 3 1
560,000	100	Apl. 1	5	Met. of } 5 p.c. Deb.	100—102	..	4 18 0
250,000	100	,,	4½	Melbourne } 4½ p.c. Deb.	100—102	..	4 8 3
541,920	20	May 31	3½	Monte Video, Ltd.	12⅞—13⅜	..	5 5 8
1,775,892	Stk.	July 28	4½	Newc'tle&G'tesh'd Con.	102—104	+1	4 4 2
529,705	Stk.	June 30	3½	Do. 3½ p.c. Deb.	87—89	..	3 18 8
55,940	10	Mar. 10	7	North Middlesex 7 p.c.	15—16	..	4 7 6
300,000	Stk.	Apl. 27	8	Oriental, Ltd.	138—140	..	5 14 4
60,000	5	Apl. 12	8	Ottoman, Ltd.	6¾—7¼	..	5 10 4
31,800	53	Aug. 16	13	Portsea Island A	132—136*	..	5 1 0
100,000	50	,,	12	Do. C	117—122*	..	4 18 4
398,490	5	May 31	8	Primitiva Ord.	7¼—7⅝	..	5 6 8
796,980	5	June 30	5	Do. 5 p.c. Pref.	5¼—5½	..	4 10 11
488,900	100	June 1	4	Do. 4 p.c. Deb.	97—99	..	4 0 10
312,650	Stk.	June 30	4	River Plate 4 p.c. Deb.	95—97	..	4 2 6
250,000	10	Mar. 24	9	San Paulo, Ltd.	21½—22½	..	4 0 0
115,000	10	,,	6	Do. 6 p.c. Pref.	12—12½	..	4 16 0
125,000	50	July 1	5	Do. 5 p.c. Deb.	49½—50½	..	4 19 0
135,000	Stk.	Mar. 24	10	Sheffield A	237—239	+1	4 3 8
209,984	,,	,,	10	Do. B	237—239	+1	4 3 8
523,500	,,	,,	10	Do. C	237—239	+1	4 3 8
70,000	10	June 15	7	South African	8½—9½	..	7 7 4
6,429,895	Stk.	Aug. 16	5/9/4	South Met., 4 p.c. Ord.	116½—118½*	+¼	4 12 2
1,895,445	,,	July 14	3	Do. 3 p.c. Deb.	78½—80½	..	3 14 6
209,820	Stk.	Aug. 16	8½	South Shields Con. Stk.	150—152*	..	5 11 10
605,000	Stk.	,,	5⅝	S'th Suburb'n Ord. 5 p.c.	117½—119½*	..	4 14 9
60,000	,,	,,	5	Do. 5 p.c. Pref.	115½—117½*	..	4 5 1
117,058	,,	July 14	5	Do. 5 p.c. Deb. Stk.	121—123	..	4 1 4
502,310	Stk.	May 12	5	Southampton Ord.	108—110	..	4 10 11
120,000	Stk.	Aug. 16	7½	Tottenham } A 5 p.c.	144—147*	+½	4 17 0
483,940	,,	,,	5⅝	and } B 3½ p.c.	114—116*	+¼	4 17 0
149,470	,,	June 15	4	Edmonton } 4 p.c. Deb.	96—98	..	4 1 8
182,380	10	June 15	8	Tuscan, Ltd.	8⅜—9¼	..	8 13 0
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	96—98	..	5 2 0
236,476	Stk.	Aug. 16	5	Tynemouth, 5 p.c. max.	113—115*	+½	4 6 11
255,636	Stk.	Feb. 24	6⅞†	Wands- } B 3½ p.c.	143—145	+2	4 14 10
85,766	,,	June 30	3	worth } 3 p.c. Deb. Stk.	71—73	..	4 2

Prices marked * are "Ex. div." † Next dividend will be at this rate.

Committee consider the question of disposing of the balance. Mr. Paterson, in seconding, pointed out that there had been an increase of 576 consumers during the year. Bailie Robinson moved that the reduction to the ordinary consumers be 3d. He considered that if they wanted continued prosperity they must have cheap gas. Bailie Williamson suggested that the whole matter of the surplus be taken back by the Committee, for the reason that the question should be dealt with as a whole. Bailie Mitchell said that the penny-in-the-slot consumers had been ignored. He agreed with the suggestion of Bailie Williamson. The proposals of the Committee were eventually adopted by twelve votes to seven.

On June 27 last, a short summary was given in this column of the accounts for the year of the Arbroath Corporation gas undertaking. A fuller statement is now presentable. It has been already stated that the gas manufactured during the year amounted to 103,516,900 cubic feet —an increase of 5,003,500 cubic feet over the previous year. It may now be added that the quantity of gas made per ton of coal carbonized was 9848 cubic feet—an increase of 169 cubic feet upon the previous year. The quantity of gas sold was 95,843,689 cubic feet—an increase of 3,755,357 cubic feet. Gas sold to ordinary consumers showed an increase of 671,557 cubic feet; to prepayment meter consumers, an increase of 3,155,200 cubic feet; and to engine proprietors, a decrease of 72,100 cubic feet. The total amount received for gas sold was £13,650—an increase of £563. Allowing for gas used on the works, &c., amounting to 2,718,438 cubic feet, there remained 4,954,773 cubic feet unaccounted for, equal to 4·78 per cent. of the manufacture. The number of cookers, grillers, and gas-rings now fixed for consumers free of cost is 4476—an increase of 130. In addition, there were 74 gas-radiators hired to consumers; and 53 gas-fires for heating rooms were sold and fixed. The gas-stove capital account stood at May 15 in the following position: Estimated value at May 15, 1910, £4896; expended during the year on radiators and cookers, £467 (£5363), less 10 per cent. for depreciation, amounting to £536, and leaving the value at May 15 last, £4827. After allowing for depreciation upon cookers, the gross profit for the year was £5136; and after paying interest and annuities, and the sums payable to the Harbour Trustees and to the sinking fund, there remained a net balance of £2274. Placing this to the suspense account would reduce it to £1909. Making allowance for the rebates to large consumers for the past year, which had not yet been ascertained, and also the amount which would be required for new pipes, a new pump, and extraordinary repairs, the Manager—Mr. A. C. Young—estimated that, at the present prices, there would be a balance of profit at May 15 next of £2426. Having regard to the fact that the capital debt on the works had been reduced since May, 1902, from 18s. 2d. to 11s. 6d. per 1000 cubic feet of gas accounted for, notwithstanding that a large amount incurred in the purchase of cookers and prepayment meters had been paid off, irrespective of all the new plant laid down at the works since 1902, and taking into account the progress made during the past nine years in the reduction of the capital debt as compared with the actual value of the gas-works, the Manager was of opinion that a reduction of 2½d. per 1000 cubic feet might now be recommended. This reduction, as already stated, would make the prices of gas: To ordinary consumers, 2s. 6d.; to prepayment meter consumers, 2s. 11d.; and for gas-engines, from 2s. 1d. to 2s. 3½d. per 1000 cubic feet, according to the quantity consumed. The Gas Committee, considering the very satisfactory financial position of the gas undertaking, unanimously agreed to recommend that the reduction in the prices of gas proposed by the Manager should be adopted. The Manager further submitted for the consideration of the Committee the expediency of obtaining statutory powers for a further reduction in the illuminating power of the gas to 14 or 15 sperm candles. At present, the candle power is 20, to which it was reduced by the Burgh Gas Act of 1899. The proposal was favourably entertained, and was continued for consideration. When the accounts came before the Town Council last Tuesday, Mr. G. R. Wallace, the Convener of the Gas Committee, said that the Manager's report was highly gratifying. The quantity of gas sold during the year was almost 4 million cubic feet more than in the previous year. The prices now proposed to be charged were as low as in many towns situated quite close to the coalfields. Everything showed careful and efficient management at the gas-works. If all went well, the Committee would be able to make a further reduction next year. The whole of the minutes reflected the shrewd, able, and businesslike way in which the works were managed by Mr. Young. He moved approval of the minutes. This was seconded by Provost Alexander, and was unanimously agreed to.

There is something more than usually gratifying in the annual report by Mr. S. Dickie, the Manager of the Dumfries Corporation Gas Department, in that, it being his first annual report, it is of a highly satisfactory nature. The quantity of coal carbonized was 11,238 tons, the average cost of which were 13s. 8·14d. per ton. For enriching, 8658 gallons of benzol was used. The average cost of coal and benzol per ton was 14s. 0·33d. In the preceding year, 11,442 tons of coal and 12,320 gallons of benzol were used, at an average cost of 14s. 3·11d. per ton. The quantity of gas made was 113,676,000 cubic feet, an average yield of 10,115 cubic feet per ton of coal—a total increase of 2,106,000 cubic feet and of 357 cubic feet per ton of coal. Gas sold, including that used in the works, amounted to 107,061,906 cubic feet—an increase of 1,886,093 cubic feet. Unaccounted-for gas was equal to 5·81 per cent.—about the same as in the preceding year. Mains and services had been repaired and renewed at a cost of £474. Meters had been tested, and, where necessary, repaired or replaced, at a cost of £558. The sulphate plant continued to give every satisfaction; excellent results having been obtained from it during the year. Though the coal carbonized was about 200 tons less, there had been 26 tons more sulphate made; and the sulphate produced was of a high quality, and met with a ready market. The net sum received for sulphate was £1539—an increase of £437. There was a net profit in the sulphate department of £763. During the early part of last winter, stoking machinery was erected. It had been in operation for six months, and had given every satisfaction. Though less coal was used, there was an increased make of over 2 million cubic feet of gas, and an average

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yield per ton of coal which had not been exceeded during the past twenty years. A new coal-store had been completed. The reserve fund amounts to £1526. In the estimates prepared for the current year, a probable balance was stated, after providing for interest, sinking fund, and reserve fund, of £1180. This, in Mr. Dickie's opinion, would allow a reduction of 2d. in the price of gas, and leave a prospective balance of £316. The Gas Committee agreed to recommend that the price of gas be reduced by 2d. per 1000 cubic feet; that Mr. Dickie's salary be increased by £50 a year; that the present collector be appointed cashier, at an increase of salary of £10; and that the Council advertise for a collector. These recommendations have yet to come before the Town Council.

In the Wishaw Town Council on Monday, Provost Thomson stated that he had gone over the burgh accounts with the Burgh Chamberlain, and he was very pleased to be able to report that everything was in a very satisfactory condition. The Council would be gratified to learn that, as regarded the Gas Department, the balance on hand a year ago was £267, and it was now £923—a betterment of £656. He thought it was only right to state that the Convener of the Gas Committee and the Gas Manager deserved the appreciation of the Council for their carefulness in bringing about this result.

The Town Council of Airdrie have reduced the price of gas to 2s. 6d. per 1000 cubic feet to ordinary consumers, and to 2s. 8d. to prepayment meter consumers—a reduction in both instances of 2d.

Councillor Gordon, of Peterhead, is under a misapprehension when he regards critical remarks upon the accounts of the gas undertaking by the Auditors as disclosing something which requires remedying. He evidently does not understand the ways of auditors and of the Scotch Office. At the meeting of the Town Council on Monday, he asked the Convener of the Gas Committee who made the valuation of the stocks in the gas-works at the 15th of May last; and when the Council would have the opportunity of discussing the report by the Auditors on the financial position of the gas undertaking. He considered the state of matters disclosed to be very serious indeed. He complained that the Gas Committee had deferred consideration of the Auditors' report until the Secretary for Scotland should comment upon it, which, to his mind, was indefinite. Bailie Birnie, the Convener of the Gas Committee, replied that the stocks were valued by the gas-works officials. As to the second part of the question, the minute of the Committee contained all the information they were prepared to disclose.

Berwick Water Supply.—The condition of the Berwick water supply, which has been the subject of repeated reports and correspondence with the Local Government Board, has at length reached a crisis; the Board having taken action under the Public Health Act and issued a default order, declaring that the insufficient and unwholesome water supply in the Tweedmouth district is a danger to the health of the inhabitants, and ordering the Berwick Town Council to provide a proper supply within six months.

CURRENT SALES OF GAS PRODUCTS.

[For Table of "Tar Products Prices," see p. 504.]

LIVERPOOL, *Aug.* 19.

Sulphate of Ammonia.

The market has again been disturbed by strikes, and prices have been somewhat irregular. On the whole, however, values have improved slightly, and the nearest closing quotations are £14 2s. 6d. per ton f.o.b. Hull, £14 3s. 9d. per ton f.o.b. Liverpool, and £14 5s. per ton f.o.b. Leith, delivery as soon as the strikes are over. There has been a fair amount of inquiry in the forward position, and £14 5s. per ton has again been paid for September-December delivery, as also for January-June, 1912. At the close, an advance is being asked, but so far it is not reported to have been paid.

Nitrate of Soda.

There is no alteration to report in this market, which remains quiet, and 9s. 10½d. per cwt. for 95 per cent. and 10s. for refined quality are still the quotations.

LONDON, *Aug.* 21.

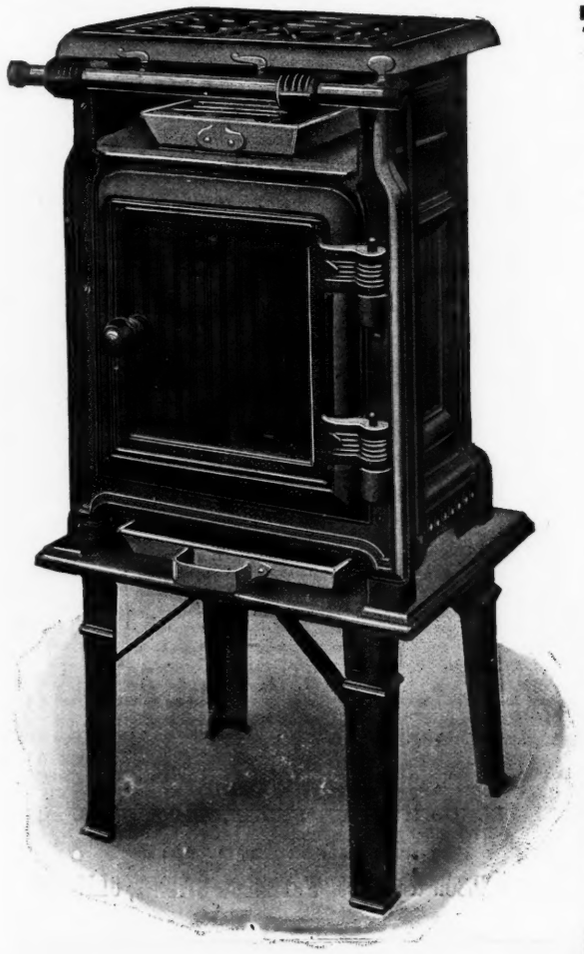
Tar Products.

The markets for tar products are firm all round. Pitch is very steady, although there is not any actual advance in price during the last week. Benzol is still very firm, particularly for prompt delivery. Solvent naphtha is quiet; and there are sellers at low prices for both prompt and forward delivery. Heavy naphtha is quiet for prompt, but is firm for forward. Creosote is firm for both prompt and forward delivery. Carbolic acid is still firm; but there does not seem to be quite so much demand for it as was the case a week or ten days ago. Naphthalene is steady; and there is an inquiry for salts beginning for the winter trade.

The average values during the week were: Tar, 21s. to 25s., *ex* works. Pitch, London, 40s. 6d. to 41s. 6d.; east coast, 40s. to 41s. 6d.; west coast, Manchester, 39s. 6d. to 40s. 6d., f.a.s.; Liverpool, 40s. 6d. to 41s., f.a.s.; Clyde, 40s. to 41s., f.a.s. Benzol, 90 per cent., casks included, London, 9⅜d. to 10¼d.; North, 9¼d. to 9⅜d.; 50-90 per cent., casks included, London and North, 9¼d. to 9½d. Toluol, casks included, London, 10d.; North, 9¼d. to 9½d. Crude naphtha, in bulk, London, 4d. to 4¼d., North, 3¼d. to 3½d.; solvent naphtha, casks included, London, 11d. to 11½d.; North, 10d. to 10½d.; heavy naphtha, casks included, London, 11½d. to 1s. 0½d.; North, 10d. to 10½d. Creosote, in bulk, London, 2 7/16d. to 2½d.; North, 2d. to 2¼d. Heavy oils, in bulk, 2¾d. Carbolic acid, 60 per cent., casks included, east coast, 2s. to 2s. 3d.; west coast, 1s. 11d. to 2s. 2d. Naphthalene, £4 10s. to £8 10s.; salts, 42s. 6d. to 45s., bags included. Anthracene, "A" quality, 1½d. to 1¾d. per unit, packages included and delivered.

Sulphate of Ammonia.

This article has been very firm throughout the past week, and prices close with an advance and a slight upward tendency. The



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principal Gas Companies quote £13 15s. for 25 per cent. usual terms; and it is believed they have very little to sell even at this figure. Outside London makes are quoted £13 12s. 6d. In Hull, the quotation is £14 to £14 2s. 6d., the latter figure having been paid for a good make. In Liverpool, £14 2s. 6d. to £14 5s. is asked; and it is reported that £14 2s. 6d. has been paid for October-June. In Leith, £14 6s. 3d. to £14 7s. 6d. is asked, and £14 5s. has been paid for October-March. In Middlesbrough, £14 2s. 6d. is said to have been paid.

COAL TRADE REPORTS.

Northern Coal Trade.

There has been in the Northern coal trade the irregularity which set in when the fear of a national railway strike was known, and which influenced prices considerably. Best Northumbrian steam coals grew firmer, and may now be quoted at about 11s. 3d. per ton f.o.b.; second-class steams are 9s. 3d. to 10s.; and steam smalls are 5s. to 6s. But some of these quotations are nominal, with variation according to the time that delivery is expected to be given. The output has been restricted in the closing days of the week. In the gas-coal trade, some producers make shipments over their own lines and staiths, and there was less interference with their production in consequence. Durham gas coals vary in price. Second-class coals are from 9s. 6d. to 9s. 9d. per ton f.o.b.; best Durhams are from 10s. 10d. to 11s.; and "Wear specials" are from 11s. 4½d. to 11s. 6d. The home demand is growing. That for export is fair, and would be stronger if it could be met, but the difficulties of transport have of late been great. In coke, the market is firmer. Good gas coke is still rather scarce, and is quoted at about 14s. 6d. to 14s. 9d. per ton f.o.b. in the Tyne or Wear.

Scotch Coal Trade.

Trade has been fairly active, with prices well maintained. All classes of coal for shipment are in good demand. The labour troubles are affecting transport, but not prices as yet. Steam coal is in request, more so than washed stuffs and smaller sorts. Prices may now be quoted at: Ell, 9s. 3d. to 10s. 3d. per ton f.o.b. Glasgow; splint, 9s. 6d. to 9s. 9d.; and steam, 9s. 3d. to 9s. 6d. The shipments for the week amounted to 381,441 tons—an increase upon the previous week of 52,717 tons, and upon the corresponding week of 35,336 tons. For the year to date, the total shipments have been 9,884,255 tons—an increase upon the corresponding period of 132,982 tons.

Gas Consumption by Cooker Users in Oldham.

Up to now, the Gas Committee of the Oldham Corporation have supplied cookers without making any stipulation in regard to the quantity of gas to be consumed by the users. It has now, however, been deemed necessary to impose something like a sliding-scale of consumption; and the General Manager of the Gas Department (Mr. Arthur Andrew) has suggested that anyone having a gas-cooker fixed of which the list price is less than 10s. should undertake to consume 8000 cubic feet of gas per annum (this being the present average), or else pay a fine of 6d. per 1000 cubic feet; when the list price of the cooker is under 20s., the consumption to be 10,000 cubic feet; when it is 20s. and under 30s., 12,000 cubic feet; 30s. and under 40s., 14,000 cubic feet; 40s. and under 50s., 16,000 cubic feet; and when 50s. and under 60s., 18,000 cubic feet. In the case of special list prices above 50s., the consumption is to be 20,000 cubic feet per annum. In each case, the fine of 6d. per 1000 cubic feet would be imposed when the specified consumption was not reached. The scale would apply alike to consumers of gas and electricity having gas-stoves in use. The suggestion came before the Committee at their meeting last Wednesday, and was adopted. The result of the decision, if the Council adopt the new scale, is that the consumer will have to undertake to use a minimum quantity of gas annually for all purposes according to the cost of the cooker. He will also have to pay to the Corporation the cost of any damage or injury by fire or otherwise which the stove may sustain while in his possession—reasonable wear and tear in the use only excepted. The Corporation are to be at liberty to remove the stove at any time without notice. The Electricity Committee have passed a resolution expressing regret that the decision was come to without conferring with them on the matter.

Mitcham and Wimbledon Gas Company.—The accounts which the Directors of this Company will present at the half-yearly general meeting next Tuesday show that the revenue for the six months ended the 30th of June was £76,749, and the expenditure £61,907; leaving a balance of £14,842 to go to the profit and loss account. After providing for all charges, the sum available for distribution, including the balance brought forward, is £18,225; and the Directors recommend the declaration of the statutory dividend under the sliding-scale at the rate of 5⅛ per cent. per annum (less income-tax). They state that the Company's business continues to expand satisfactorily in all branches. A further reduction in the price of gas has been made from Midsummer last—viz., from 2s. 10d. to 2s. 8d. per 1000 cubic feet.

Barnet Gas and Water Company.—The half-yearly meeting of this Company will be held next Tuesday, when the Directors will report that the balance standing to the credit of the profit and loss account amounts to £30,885, out of which they recommend the declaration of a dividend for the past half year at the rate of 8 per cent. per annum on the "A" and "C" stocks; 7 per cent. per annum on the "B" stock; and £5 12s. per cent. per annum on the "D" capital. The Engineer (Mr. F. J. Bancroft, M.Inst.C.E.) reports that the works are in good repair and condition. The contractors are still proceeding with the erection of the buildings and machinery at Tyttenhanger; and the Directors state that, by means of a temporary plant, sufficient water was obtained from this source to enable them to maintain a full supply during the recent drought. The sinking of the well at North Mimms is also still proceeding.

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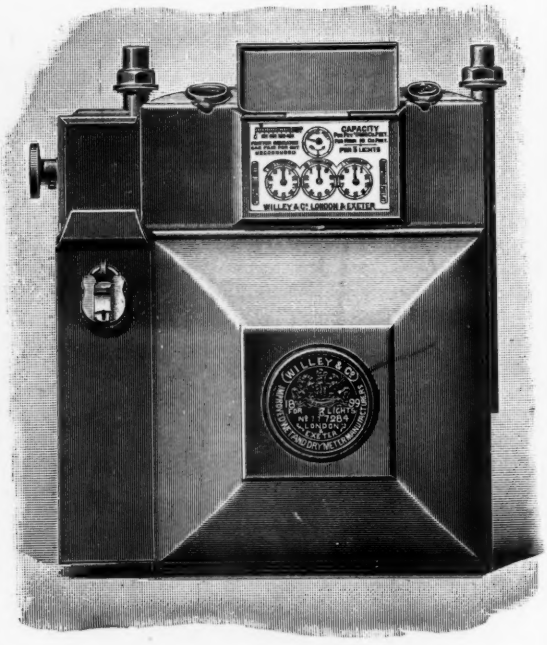

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Important Water Scheme for Blackpool and the Fylde.—In the course of the proceedings at the meeting of the Bowland District Council at Clitheroe on Monday last week, reference was made to a Bill to be promoted to provide a new reservoir and water-works for Blackpool and the Fylde, at an estimated cost of about £2,000,000. It is proposed to construct a large reservoir at Dalehead, near Slaidburn, which is in the area of the District Council, and forming the Yorkshire part of the Clitheroe Union. The site is at the head of the Hodder Valley, and all the water from the range of hills stretching almost to Lancaster in one direction and Bentham in the other, and including some very fine springs, will, it is said, be taken. It was stated at the meeting that the whole of the inhabitants of the Hodder Valley would probably oppose the scheme, as it meant interfering with their water supply.

South Essex Water-Works Company.—At the half-yearly general meeting of this Company on Monday last week, the Chairman (Mr. C. C. S. Fooks) stated that they were going on very satisfactorily, and were again declaring their maximum rates of dividend. When the Dagenham well was finished, which they believed would be in about twelve or fifteen months, they hoped their expenditure would to a certain extent come to an end, and that they would then only have to incur the moderate outlay necessary for coupling-up existing mains and putting down new distributing plant. Their expenditure in the past half year was £11,495 to earn a gross revenue of £28,747, against £11,915 for the corresponding period of last year to earn a gross revenue of £27,430. The works were in an efficient condition, and they had water enough and to spare. He concluded by moving the adoption of the report and the payment of the dividends recommended; and it was carried.

Rossendale Union Gas Company's Increased Sales.—In the report of the Directors of the Rossendale Union Gas Company, they state that the sales of gas for the past half year showed an increase of 9·57 per cent. compared with the corresponding period of 1910. The income was £24,203, and the expenditure £18,011; leaving a profit of £6192. The statutory dividends on the several classes of shares, ranging from 5 to 10 per cent., are to be paid. The Directors also refer to the reduction in the price of gas, which came into operation on the 1st of July—viz., 1d. per 1000 cubic feet to ordinary consumers, and 3d. per 1000 cubic feet on gas used for engines and stoves. The price for purposes other than illumination is now 2s. 6d. per 1000 cubic feet, less 2½ per cent. discount. Consumers for lighting who use more that 500,000 cubic feet per quarter are charged 3s., and less than this quantity 3s. 1d., with the usual discount in each case of 2½ per cent. if the account is paid within a month.

Income-Tax on Transfers to Special Purposes Funds.—In the course of the proceedings at the recent half-yearly general meeting of the Aldershot Gas, Water, and District Lighting Company, reported elsewhere, the General Manager and Secretary (Mr. R. W. Edwards) stated that there had been a little controversy between himself and the authorities of the Inland Revenue with regard to the transfers from the revenue account to the special purposes fund being subject to income-tax. "We being," said Mr. Edwards, "among the very first companies with this particular clause, the point had not been settled in income-tax law, and it has taken a little time to settle the question. A good deal has passed between myself and the Inland Revenue, and the Company have taken advice otherwise than my own; and they are now convinced that, for the present, possibly the Inland Revenue ruling was correct—namely, that the transfer from revenue to the special purposes fund is subject to tax. But, on the other hand, I should say that the Inland Revenue admitted that any expenditure from the fund should be free from income-tax. You will see, therefore, that it is pretty well as broad as it is long."

Brighton and Hove Gas Company.—At the half-yearly general meeting of this Company next Friday, the Directors will report an increase of 39,876,900 cubic feet, or 6·37 per cent., in the quantity of gas sold in the six months ended the 30th of June, compared with the corresponding period of 1910; and the returns from residuals were higher by £2263. The half-year's profits, including a sum received for interest, amount to £34,103, to which is added £19,755 brought forward; making a total of £53,859. After charging interest on debenture stock, &c., and appropriating £1800 to the capital redemption fund, and £2968 to the special purposes fund, a sum of £45,979 is available for distribution. The Directors accordingly recommend the declaration of dividends for the half year at the following statutory rates per annum—viz., 6 per cent. on the "B" preference consolidated stock; 4 per cent. on the "C" preference consolidated stock; 11 per cent. on the original ordinary consolidated stock; and 8 per cent. on the "A" ordinary consolidated stock. This appropriation will require £23,580, and leave a balance of £22,399 to be carried to the credit of the profit and loss account for the current half year.

Water Scheme for Ilsington.—The Newton Abbot Rural District Council having applied to the Local Government Board for authority to borrow £4900 for the purpose of providing a supply of water for the parish of Ilsington, the matter was inquired into a few days ago by Dr. A. W. Brightmore, one of the Board's Inspectors. The principal source of the present supply is a stream, which is liable to pollution; and it is proposed to obtain water from several underground springs, and to construct a reservoir to hold 50,000 gallons, which would be rather more than four days' supply for a population of 600 at 20 gallons per head. Mr. S. Segar, the Council's Engineer, admitted that the gaugings of the springs had shown a disappointing falling-off, and that the present yield of 9000 gallons a day was insufficient. Objection was raised to the scheme on the ground that owners of property had been called upon to provide water supplies at their own expense, and now they were asked to sanction an additional supply which would involve a rate of 1s. 6d. in the pound; making, with the present rates, 5s. 9d. The scheme was characterized as both extravagant and premature. The Chairman of the Parish Council (Mr. H. H. Bickford) said the feeling was in favour of an improved supply, but the outlying hamlets were against the scheme. At the close of the inquiry, the Inspector visited the source of the proposed supply, and went over the line of the works.

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Leakage of Paraffin into a Well.—An escape of paraffin from tanks at the pumping-station of the Portland Water-Works at Upwey, Dorset, early last week, rendered Portland's 17,000 inhabitants temporarily waterless. Some gallons of paraffin escaped into the lower well; rendering the water supply undrinkable. The whole of the water at the works—estimated at 100,000 gallons—had to be pumped to waste before drinking water was obtainable.

Leatherhead Water Company.—The receipts for the six months ended the 30th of June of the Leatherhead and District Water-Works Company amounted to £5011, and the amount available for distribution at the recent half-yearly meeting was £3117. The dividends declared were at the rate of 10 per cent. on the original shares, and of 7 per cent. on the remainder. These dividends absorbed £2050; and left £1067 to be carried forward. Since 1901, the water-rentals have increased from £4897 to £8995; and the quantity of water pumped from 131 million gallons to 220 millions.

Reductions in Price.—The Directors of the Cowdenbeath Gas Company, Limited, have fixed the following as the rates per 1000 cubic feet of gas to take effect on and from the reading of the meters next month: Ordinary lighting purposes, 3s. 9d.; heating installations, 3s. 4d.; trading purposes, 2s. 11d.; power, 2s. 6d. In the case of prepayment consumers, the dividend will be increased from 2s. 6d. to 3s. 4d. in the pound. The reduction is 2½d. per 1000 cubic feet for ordinary purposes and 7½d. for power. The Gorebridge Gas Company have reduced their price 5d. per 1000 cubic feet—from 5s. 10d. to 5s. 5d.

Burst Water-Main near Rhayader.—Early on Sunday morning, the 13th inst., one of the mains conveying water from the Elan Valley reservoir to Birmingham burst. The accident occurred on the Builth Road, and about half-a-mile out of Rhayader. After the bursting of the pipe, the ground rose rapidly, and the force of the water swept away tons of soil, and large pieces of pipe were carried into the field below. Two of the mains convey, on an average, 24 million gallons of water per day to Birmingham. The efficiency of the scheme was again proved; for, although the burst caused a decrease in the delivery, the people of Birmingham were fairly adequately supplied from a large emergency reservoir outside the city.

Tarapaca Water-Works Company.—At an extraordinary meeting of this Company on Monday last week, the Chairman (Sir Robert Harvey) said they had already reduced the original capital of £400,000 by £80,000; and by the return of £2 per share now proposed to be made, it would be reduced to £240,000. For 23 years shareholders had been receiving practically the same dividends; and so far this year there had been no diminution in the earnings. But the Municipality had continually endeavoured to force the hands of the Government to provide a supply of water in opposition to the Company's; and sooner or later they would have to face a reduction in price to meet the situation. With a return of capital, they should be in a position to defy any opposition and still pay a good dividend. He moved a resolution for reducing the capital by returning £2 per share on each of the 40,000 shares; and it was carried.

We have received from the Provincial Incandescent Fittings Company, Limited, of Manchester, their "Block Light" and "Pifco" catalogues for the season 1911-12. Most of the illustrations in the former are of new goods either registered or patented or otherwise protected. The other catalogue, the size of which has been increased by twenty pages, contains 300 more numbers than that of last year, and 250 new blocks representing the latest innovations in connection with incandescent gas lighting.

The Horstmann Gear Company, Limited, of Bath, find they were fully justified in moving to their new and larger factory, for the influx of orders for controllers, &c., for the coming lighting season has been beyond their anticipation. Large consignments have, we are informed, been despatched to Australia, New Zealand, America, and the Continent of Europe; while their home trade has been well sustained. A repeat order from the Liverpool Corporation for 250 controllers has just been received (making 750 required this year); while large orders are being executed for Aldershot, Worthing, and other places.

The "Daily Telegraph" last Thursday contained the following story under the heading of "Red Tape Prevents Arrest:" William Hawkins, of 69, Fortescue Road, Mitcham, who gave himself up at Tooting Police Station, was remanded at Croydon yesterday by the County Magistrates, on a charge of stealing a quantity of gas belonging to the Mitcham and Wimbledon Gas Company. His wife, who was first arrested, had been on bail since July 17; but her discharge was granted on Tuesday—the prosecution offering no further evidence in her case. Hawkins is alleged to have connected pipes with the Gas Company's service-pipe in his house in such a way as to prevent the amount of gas consumed being registered. Mr. Cubison, representing the Gas Company, told the Bench that the man was traced to one of the War Office departments, and would have been arrested but for a gross piece of red-tapeism. They were unable to discover the head of the department in which the prisoner was working; and although the detective officer went to the head clerk, he was told he could not enter the department unless the head went with him. When the head arrived about an hour later, the prisoner had disappeared, leaving his tools behind him. Somebody must have told him he was wanted.

TAR PRODUCTS PRICES.

Representative manufacturers give the following as fair current values for the week ending Aug. 19. Prices are net, and they include the usual packages and delivery f.o.b., f.a.s., or f.o.r., as customary.

Article.	Basis.	London.	North-East Coast.	East Coast, Yorks.	West Coast.	
					Liverpool.	Manchester.
Tar, crude	per ton	—	20/- 25/-	20/9 24/9	—	21/- 23/6
Pitch	„	42/6	39/- 40/-	40/-	40/-	39/-
Benzol, 90%	per gallon	-/11½	-/9½ -/10	-/9	-/9¼	-/9⅝
Benzol, 50-90%	„	—	-/10	-/9½	-/8¼	-/8½
Toluol, 90%	„	—	-/10	-/10	-/10	-/10
Crude naphtha, 30%	„	—	-/4¼	-/4	-/3¾	-/3¾
Light oil, 50%	„	—	-/3½	-/3¾ -/4	-/3½	-/3½
Solvent naphtha, 90-160	„	—	-/10 -/10½	-/10	-/10	-/10
Heavy naphtha, 90-190	„	—	-/11	-/11½	-/11¼	-/11¼
Creosote in bulk	„	-/2¾	-/2 1/16	-/2	-/2⅛	-/2⅛
Heavy oils	„	—	-/2⅛ -/2⅝	-/2¼	-/2⅜	-/2¾
Carbolic acid, 60's	„	—	2/1	2/3	1/11	1/11½
Naphthalene, crude drained salts	per ton	—	43/9	41/3	47/6	47/6 50/-
„ pressed	„	—	60/-	63/-	60/-	60/- 72/6
„ whizzed	„	—	—	—	70/- 72/6	65/- 75/-
Anthracene	per unit	-/2	-/1½	-/1½	-/1¾	-/1¾

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

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WORKING MANAGER. Liverpool Corporation Gas-Works. Applications by Aug. 30.

FOREMAN (TAR-WORKS). No. 5438.

JUNIOR ASSISTANT. Cambridge Gas Company.

JUNIOR CLERK. Melton Mowbray Gas-Works.

STOKER. Halesowen Gas-Works.

Plant, &c. (Second-Hand), for Sale.

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PIPES, MOUTHPIECES, &c. J. Adams and Sons, Newcastle-on-Tyne.

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Pitch, Creosote, Brick and Fuel Oils, Benzol, Solvent Naphtha, Carbolic, Sulphate of Ammonia.

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THE very best Patent Grids for Holding Oxide Lightly.
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Results Guaranteed. No Working Costs.
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STOKER WANTED.—Particulars from the MANAGER, Gas-Works, Halesowen, BIRMINGHAM.

WANTED, a Foreman for a Small Tar-Works.
Apply, by letter, stating Experience and Wages required, to No. 5438, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Chemical Assistant in an INCANDESCENT MANTLE FACTORY.
Apply, by letter, to Box 311, W. H. SMITH AND SONS' Kingsway Shop, LONDON, W.C.

JUNIOR Clerk wanted by the Melton Mowbray Gas Company.
Apply, by letter, stating Age, Experience, and Salary required to the CHAIRMAN.

CAMBRIDGE UNIVERSITY AND TOWN GASLIGHT COMPANY.
WANTED, by the above Company, a JUNIOR ASSISTANT to the Engineer. Must be a good Chemist, capable of making the necessary Tests in the Works, including Photometry.
Salary, £80 per Year.
Applications, stating Age, Qualification, and Experience, with *copies* of Testimonials, to be addressed to JAS. W. AUCHTERLONIE, Engineer and Manager, Gas Company's Offices, CAMBRIDGE.

CORPORATION OF LIVERPOOL.
(FAZAKERLEY GAS-WORKS.)
WANTED, a Working Manager.
Applicants must be good Carbonizers, thoroughly Experienced and able to perform the usual Works Routine, together with keeping ordinary Gas-Works Day Books, and have Practical knowledge of Main and Service Laying and Internal Gas-fitting; also able to read Gas-Meters, as well as Advise Gas Consumers.
Annual make, about 20 Millions.
Salary, £100 per Annum, with House, Coal, and Gas free.
Applications, endorsed "Working Gas Manager," to be addressed to the Town Clerk, Municipal Offices, Liverpool, and must be received not later than the 30th of August next.

WHAT offers for One 50-Light and Three 100-Light Dry Tin-Cased GAS-METERS? Thoroughly overhauled, and equal to new.
Address No. 5424, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

FOR SALE—6-inch Bridge Pipes, MOUTHPIECES, 21 in. by 15 in.; ASCENSION PIPES, BRANCH PIPES, and all Accessories for Gas-Making Plant. Cheap to quick purchaser.
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FOR SALE—One Set of 4 Purifiers, 10 feet Square, 10-inch Connection and Valve, in Good Order. Replaced by larger. Can be viewed on Application.

Philip Allison,
Secretary.

Aug. 16, 1911.

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OFFERS wanted for about 100 Tons, delivered alongside Ship in London in One Parcel. Address, No. 5440, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

LISBURN URBAN DISTRICT COUNCIL.

THE Gas Committee of the above Council invite OFFERS for the Purchase of the undernoted PLANT, which is to be ready for Removal early in December, owing to its being replaced by larger plant.

Four Cast-Iron PURIFIERS 9-feet square, with Centre Valve and 8-inch Connections.
One Cast-Iron CONDENSER, consisting of Ten 8-inch double pipes 18 feet high with Bottom Box. 8-inch Connections.
One Cast-Iron TOWER SCRUBBER 30 ft. by 6 ft., 12-inch Connections and Bye-Pass.
One ROTARY WASHER, 6-inch Connections,
One Round STATION METER, 5000 feet per hour, 6-inch Connections and Bye-Pass.

The above Plant may be inspected, and any further Information obtained, on Application to the Gas Manager.

Tenders, endorsed "Old Plant," to be sent to the undersigned on or before Sept. 16, 1911.

T. M. Wilson,
Town Clerk.

Town Hall, Lisburn,
Dated this 17th day of August, 1911.

RHONDDA URBAN DISTRICT COUNCIL.
(Gas and Water Department.)

THE Council are prepared to receive TENDERS for the following:—

1.—For the Supply of LEAD and COMPO. PIPE and BLOCK TIN for the Six Months ending March 31, 1912.
2.—For the Purchase of the Surplus GAS TAR made at the Two Gas-Works (Porth and Ystrad), for a term of One Year from the 1st of November, 1911 (or for such longer Term as may be contracted for with the consent of the Council). The Tar will be loaded free into Contractor's and Council Tank-Waggons. The Purchaser will be required to enter into an Agreement with the Council for the due performance of the Contract.

Specification and Form of Tender may be obtained upon Application to the undersigned.

No Form of Tender other than that issued by the Council will be considered.

Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Tender for Lead and Compo.," or "Tar," as the case may be, and Delivered at my Office not later than Thursday (Ten a.m.), Aug. 31, 1911.

The Council do not bind themselves to accept any Tender.

Octavius Thomas,
Engineer and Manager.

Gas and Water Offices, Pentre,
Rhondda, Aug. 14, 1911.

RHONDDA URBAN DISTRICT COUNCIL.
(Gas and Water Department.)

THE Council are prepared to receive TENDERS for the following:—

Contract No. 53.—GALVANIZED ROOFS at the Porth and Ystrad Gas-Works.

Plans and Specification may be seen, and Form of Tender obtained, on Application to the undersigned upon depositing the sum of One Guinea, which will be returned after the Council have entered into a Contract upon the Tenders received, provided that he shall have sent in a *bond-fide* Tender, and shall not have withdrawn same.

The Contractor will be required to pay the Standard rate of Wages recognized in the district.

Tenders to be addressed to the Chairman of the Gas and Water Committee, endorsed "Contract No. 53," and Delivered at my Office not later than Ten a.m. on Thursday, Aug. 31, 1911.

The Council do not bind themselves to accept the lowest or any Tender.

Octavius Thomas,
Engineer and Manager.

Gas and Water Offices, Pentre,
Rhondda, Aug. 14, 1911.

COUNTY BOROUGH OF SALFORD.
(Education Committee.)

TENDERS invited, by Sept. 11, for a COMPLETE INSTALLATION of INCANDESCENT GAS LIGHTING at the Robert Hall Street Council School, Salford.

Copies of the Drawing, Specification, and Forms of Tender (for which a charge of One Guinea will be made, and which will be returned) may be obtained on Application to the Gas Engineer, Gas Offices, Bloom Street, Salford.

SALES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MESSRS. A. & W. RICHARDS beg to notify that their SALES BY AUCTION of NEW CAPITAL ISSUED UNDER PARLIAMENTARY POWERS, and of STOCKS and SHARES belonging to EXECUTORS and other PRIVATE OWNERS in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES, take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.

Terms for Issuing New Capital, and also for including other Gas and Water Stocks and Shares in these Periodical Sales, will be forwarded on Application to Messrs. A. & W. Richards, at 18, Finsbury Circus, E.C.

THOMAS DUXBURY & CO.,
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Gas Engineers' Agents and Contractors for
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Telephone 1806

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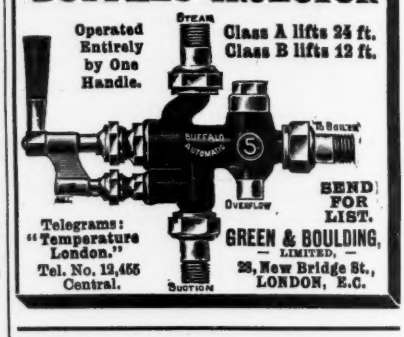

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